

**Is Employee Personality More Important than
Perceived Leadership for the Development of
Burnout and Efficacy?**

**Leslie Norman Graham
2009**

ISBN 978-90-393-5002-7

Printed by MRT Books.

© Leslie N. Graham, 2009. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without prior permission from the author.

Is Employee Personality More Important than Perceived Leadership for the Development of Burnout and Efficacy?

Is de persoonlijkheid van de werknemer belangrijker dan waargenomen leiderschap voor de ontwikkeling van “burnout” en zelfvertrouwen?

(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor aan de Universiteit Utrecht op gezag van de rector magnificus, prof.dr. J. C. Stoof, ingevolge het besluit van het college voor promoties in het openbaar te verdedigen op dinsdag 17 maart 2009 des middags te 4.15 uur

door

Leslie Norman Graham

geboren op 16 Maart 1960
te Bebington, England

Promotor: Prof. dr. A. van Witteloostuijn

CONTENTS

LIST OF FIGURES	xi
LIST OF TABLES	xv
LIST OF SYMBOLS	xxi
CHAPTER 1	
INTRODUCTION	
1.1 THE IMPORTANCE OF THE TOPICS IN THIS STUDY	1
1.2 THE PURPOSE OF THIS STUDY	12
1.3 THE DESIGN AND OUTLINE OF THIS THESIS	14
CHAPTER 2	
LITERATURE REVIEW	
2.1 BURNOUT	19
2.2 SELF-EFFICACY	27
2.3 LEADER-MEMBER EXCHANGE (LMX)	30
2.4 COMMUNICATION FREQUENCY	33
2.5 PERSONALITY	37
CHAPTER 3	
METHODOLOGY	
3.1 SAMPLE AND DATA COLLECTION PROCEDURES	45
3.2 MEASURES	47
3.3 HIERARCHICAL REGRESSION ANALYSIS	69
3.4 COMMON-METHOD VARIANCE (CMV)	83
CHAPTER 4	
THE RELATIONSHIPS BETWEEN LMX AND COMMUNICATION FREQUENCY, AND THE PERSONAL OUTCOMES OF BURNOUT AND OCCUPATIONAL SELF-EFFICACY	
4.1 INTRODUCTION	87
4.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES	87
4.3 ANALYSIS AND RESULTS	103
4.4 DISCUSSION	136
CHAPTER 5	
THE IMPACT OF THE PERSONALITY TRAITS OF CONSCIENTIOUSNESS, NEUROTICISM AND WORK LOCUS OF	

**CONTROL ON THE PERSONAL OUTCOMES OF BURNOUT AND
OCCUPATIONAL SELF-EFFICACY**

5.1 INTRODUCTION	147
5.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES	148
5.3 ANALYSIS AND RESULTS	163
5.4 DISCUSSION	206

CHAPTER 6

**THE IMPACT OF THE PERSONALITY TRAITS OF
CONSCIENTIOUSNESS, NEUROTICISM AND WORK LOCUS OF
CONTROL ON LMX AND COMMUNICATION FREQUENCY**

6.1 INTRODUCTION	219
6.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES	219
6.3 ANALYSIS AND RESULTS	225
6.4 DISCUSSION	247

CHAPTER 7

**THE IMPACT OF CONSCIENTIOUSNESS, NEUROTICISM,
WORK LOCUS OF CONTROL, LMX AND COMMUNICATION
FREQUENCY ON THE PERSONAL OUTCOMES OF BURNOUT AND
OCCUPATIONAL SELF-EFFICACY**

7.1 INTRODUCTION	255
7.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES	255
7.3 ANALYSIS AND RESULTS	257
7.4 DISCUSSION	289

CHAPTER 8

**THE IMPACT OF OCCUPATIONAL SELF-EFFICACY AND THE
PERSONALITY TRAITS OF CONSCIENTIOUSNESS AND WORK
LOCUS OF CONTROL ON BURNOUT**

8.1 INTRODUCTION	293
8.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES	293
8.3 ANALYSIS AND RESULTS	296
8.4 DISCUSSION	321

CHAPTER 9

CONCLUSIONS

9.1 GENERAL CONCLUSIONS	327
9.2 STRENGTHS AND LIMITATIONS	337
9.3 RECOMMENDATIONS FOR FUTURE RESEARCH	340
9.4 PRACTICAL IMPLICATIONS	342

APPENDICES	345
REFERENCES	403
NEDERLANDSE SAMENVATTING (<i>Dutch summary</i>)	429
ACKNOWLEDGEMENTS	435
CURRICULUM VITAE	437

LIST OF FIGURES

3.1	Scree Plot for MBI	50
3.2	Scree Plot for OCCSEFF	55
3.3	Scree Plot for LMX	57
3.4	Scree Plot for CF	59
3.5	Scree Plot for CONSC and NEURO	61
3.6	Scree Plot for the WLCS	64
3.7	Direct and Mediated Relationships	72
4.1	Interaction between Communication Frequency and Leader-Member Exchange Predicting Transformed Emotional Exhaustion	112
4.2	Relationships between LMX, Communication Frequency and Emotional Exhaustion	115
4.3	Relationship between Job Demand and Emotional Exhaustion	115
4.4	Relationships between LMX, Communication Frequency and Depersonalization	122
4.5	Relationships between LMX, Communication Frequency and reduced Personal Accomplishment	126
4.6	Curvilinear Relationship between Communication Frequency and Burnout	130
4.7	Relationship between Job Demand and Burnout	131
4.8	Relationship between LMX and Burnout	132
4.9	Relationship between Communication Frequency and Burnout	132
4.10	Relationships between LMX, Communication Frequency and Occupational Self-Efficacy	136
4.11	Interaction between Communication Frequency and Leader-Member Exchange Predicting Emotional Exhaustion (for regression of Emotional Exhaustion on Communication Frequency)	139
4.12	Interaction between Communication Frequency and Leader-Member Exchange Predicting Emotional Exhaustion (for regression of Emotional Exhaustion on LMX)	142
5.1	Interaction between Job Demand and Work Locus of Control Predicting Emotional Exhaustion	173
5.2	Relationship between Conscientiousness and Emotional Exhaustion	175
5.3	Relationship between Neuroticism and Emotional Exhaustion	175
5.4	Relationships between Work Locus of Control, Job Demand and Emotional Exhaustion	175
5.5	Relationship between Conscientiousness and Depersonalization	184
5.6	Relationship between Neuroticism and Depersonalization	184
5.7	Relationship between Work Locus of Control and Depersonalization	185
5.8	Relationship between Conscientiousness and reduced Personal Accomplishment	190

5.9 Relationship between Neuroticism and reduced Personal Accomplishment	190
5.10 Relationship between Work Locus of Control and reduced Personal Accomplishment	190
5.11 Interaction between Job Demand and Conscientiousness Predicting Burnout (MBI)	195
5.12 Interaction between Job Demand and Neuroticism Predicting Burnout (MBI)	195
5.13 Relationships between Conscientiousness, Job Demand (JD) and Burnout (MBI)	196
5.14 Relationships between Neuroticism, Job Demand (JD) and Burnout (MBI)	197
5.15 Relationship between Work Locus of Control, Job Demand (JD) and Burnout (MBI)	197
5.16 Interaction between Work Locus of Control and Neuroticism for <i>Low</i> Conscientiousness Predicting Occupational Self-Efficacy	203
5.17 Interaction between Work Locus of Control and Neuroticism for <i>High</i> Conscientiousness Predicting Occupational Self-Efficacy	203
5.18 Interaction between Conscientiousness and Work Locus of Control for <i>Low</i> Neuroticism Predicting Occupational Self-Efficacy	204
5.19 Interaction between Conscientiousness and Work Locus of Control for <i>High</i> Neuroticism Predicting Occupational Self-Efficacy	205
5.20 Relationships between Conscientiousness, Neuroticism and Work Locus of Control and Occupational Self-Efficacy	206
6.1 Curvilinear Relationship between Conscientiousness and LMX	235
6.2 Curvilinear Relationship between Conscientiousness and LMX with Additional Control Variables	235
6.3 Relationship between Communication Frequency and LMX	236
6.4 Relationship between Conscientiousness and LMX	237
6.5 Relationship between Neuroticism and LMX	237
6.6 Relationships between Work Locus of Control and LMX	237
6.7 Relationships between Job Demand and LMX	238
6.8 Relationship between LMX and Communication Frequency	245
6.9 Relationship between Conscientiousness and Communication Frequency	246
6.10 Relationships between Neuroticism and Communication Frequency	246
6.11 Relationships between Work Locus of Control, LMX and Communication Frequency	246
6.12 Interaction between Conscientiousness and LMX (LMX_H , LMX_M and LMX_L) predicting Communication Frequency	251
6.13 Interaction between Conscientiousness and LMX ($CONSC_H$, $CONSC_M$ and $CONSC_L$) predicting Communication Frequency	252
7.1 Interaction between Communication Frequency and LMX predicting Transformed Emotional Exhaustion (EE^+) whilst controlling for Gender, Tenure, Job Demand, Conscientiousness, Neuroticism and Work Locus of	264

Control	
7.2 Interaction between Communication Frequency and LMX predicting Transformed Emotional Exhaustion (EE ⁺) whilst controlling for Gender, Tenure, Job Demand, Conscientiousness, Neuroticism and Work Locus of Control	265
8.1 Interaction between Conscientiousness and Occupational Self-Efficacy for <i>High</i> Work Locus of Control Predicting Transformed Emotional Exhaustion	303
8.2 Interaction between Conscientiousness and Occupational Self-Efficacy for <i>Low</i> Work Locus of Control predicting Transformed Emotional Exhaustion	303
8.3 Interaction between Conscientiousness and Occupational Self-Efficacy for <i>High</i> Work Locus of Control predicting Transformed Emotional Exhaustion	306
8.4 Interaction between Conscientiousness and Occupational Self-Efficacy for <i>Low</i> Work Locus of Control predicting Transformed Emotional Exhaustion	307
8.5 Interaction between Conscientiousness and Work Locus of Control for <i>Low</i> Occupational Self-Efficacy predicting Transformed Emotional Exhaustion	308
8.6 Interaction between Conscientiousness and Occupational Self-Efficacy for <i>High</i> Work Locus of Control predicting Burnout	319
8.7 Interaction between Conscientiousness and Occupational Self-Efficacy for <i>Low</i> Work Locus of Control predicting Burnout	320
8.8 Interaction between Conscientiousness and Work Locus of Control for <i>Low</i> Occupational Self-Efficacy predicting Burnout	321
8.9 Relationship between Occupational Self-Efficacy and Emotional Exhaustion	322
8.10 Relationship between Occupational Self-Efficacy and reduced Personal Accomplishment	322
8.11 Relationships between Occupational Self-Efficacy, Job Demand and Burnout	322

LIST OF TABLES

3.1 Cronbach's Alpha Coefficients for Each Scale	48
3.2 Comparison of Eigenvalues from Factor Analysis and Corresponding Values from Parallel Analysis for MBI	51
3.3 VARIMAX-Rotated Component Analysis Matrix for MBI	52
3.4 Cronbach's Alpha for MBI	54
3.5 Comparison of Eigenvalues from Factor Analysis and Corresponding Values from the Parallel Analysis for OCCSEFF	55
3.6 Component Matrix for the OCCSEFF Scale	56
3.7 Component Matrix for the LMX Scale	58
3.8 Component Matrix for the CF Scale	59
3.9 Comparison of Eigenvalues from Factor Analysis and Corresponding Values from the Parallel Analysis for CONSC and NEURO	61
3.10 OBLIMIN- Rotated Pattern Analysis Matrix for CONSC and NEURO	62
3.11 Comparison of Eigenvalues from Factor Analysis and Corresponding Values from the Parallel Analysis for WLCS	64
3.12 VARIMAX-Rotated Component Analysis Matrix for the WLCS	65
3.13 VARIMAX-Rotated Component Analysis Matrix for the Twelve-Item WLCS	67
3.14 Validation of Component Factor Analysis by Split-Sample Estimation with Oblimin-Rotation	68
3.15 Normality Statistics for Variables	77
3.16 Normality Statistics for Transformed Variables	80
3.17 Descriptive Statistics for Variables	82
4.1 Bivariate Correlations for Gender, Tenure, Job Demand, LMX, CF, EE, DEP, rPA, MBI and OCCSEFF	105
4.2 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE^+) and Independent Variables Gender, Tenure and Mean-Centered JD and LMX	107
4.3 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE^+) and Independent Variables Gender, Tenure and Mean-Centered JD, LMX, and CF	108
4.4 Simple Slopes for the Equation for Curvilinear CF and Transformed Emotional Exhaustion (EE^+) Relationship, Linear LMX Relationship and a Curvilinear CF by Linear LMX Interaction	111
4.5 Regression Analysis for Dependent Variable Emotional Exhaustion and Independent Variables Gender, Tenure and Mean-Centered Job Demand, LMX and CF	113
4.6 Simple Slopes for the Equation for Curvilinear CF and Emotional Exhaustion Relationship, Linear LMX Relationship and a Curvilinear CF by Linear LMX Interaction	114

4.7	Regression Analysis for Dependent Variable Depersonalization (DEP) (With Outlier Removed) and Independent Variables Gender, Tenure and Mean-Centered JD, LMX and CF	117
4.8	Regression Analysis for Transformed Dependent Variable Depersonalization (DEP(λ)) (With Outlier Removed) and Independent Variables Gender, Tenure and Mean-Centered Transformed JD ⁺ , LMX ⁺ , and CF ⁺	119
4.9	Nonparametric Correlation Spearman's Rho for Gender, Tenure, JD, LMX, CF and DEP	120
4.10	Logistic Regression Analysis for Dependent Variable Depersonalization and Independent Variables Gender, Tenure, JD, LMX, and CF	121
4.11	Regression Analysis for Transformed Dependent Variable reduced Personal Accomplishment (rPA ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CF and LMX	124
4.12	Regression Analysis for Dependent Variable reduced Personal Accomplishment (rPA) and Independent Variables Gender, Tenure and Mean-Centered JD, CF and LMX	125
4.13	Regression Analysis for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD and LMX	127
4.14	Regression Analysis for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, LMX and CF	128
4.15	Simple Slopes for the Equation for Curvilinear CF and Burnout (MBI) Relationship	130
4.16	Regression Analysis for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CF and LMX	133
4.17	Comparison of Results between this study and those of Bakker et al. (2005) for Relationships between LMX and Components of Burnout	137
5.1	Bivariate Correlations for Gender, Tenure, JD, CONSC, NEURO, WLCS, EE, DEP, rPA, MBI and OCCSEFF	166
5.2	Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	167
5.3	Regression Analyses for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	168
5.4	Regression Analyses for Dependent Variable Emotional Exhaustion (EE) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	170

5.5	Regression Analyses for Dependent Variable Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	172
5.6	Regression Analyses for Dependent Variable Depersonalization (DEP) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS (Outlier Removed)	177
5.7	Regression Analyses for Dependent Variable Depersonalization (DEP) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS (Outlier Removed)	178
5.8	Regression Analyses for Transformed Dependent Variable Depersonalization (DEP ⁺) and Mean-Centered Independent Variables Gender, Tenure, NEURO, WLCS and Mean-Centered Transformed Variables JD ⁺ and CONSC ⁺ (Outlier Removed)	179
5.9	Regression Analyses for Transformed Dependent Variable Depersonalization (DEP ⁺) and Mean-Centered Independent Variables Gender, Tenure, NEURO, WLCS and Mean-Centered Transformed Variables JD ⁺ and CONSC ⁺ (Outlier Removed)	180
5.10	Nonparametric Correlation Spearman's Rho for Gender, Tenure, JD, Conscientiousness, Neuroticism, Work Locus of Control and Depersonalization	181
5.11	Logistic Regression Analysis for Dependent Variable Depersonalization and Independent Variables Gender, Tenure, JD, CONSC, NEURO and WLCS	182
5.12	Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	186
5.13	Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	187
5.14	Regression Analyses for Dependent Variable reduced Personal Accomplishment (rPA) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	189
5.15	Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	192
5.16	Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	194
5.17	Regression Analyses for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CF, CONSC, NEURO and WLCS	199

5.18	Regression Analyses for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CF, CONSC, NEURO and WLCS	201
6.1	Bivariate Correlations for Gender, Tenure, Job Demand, CONSC, NEURO, WLCS, LMX and CF	227
6.2	Regression Analyses for Transformed Dependent Variable Leader-Member Exchange (LMX ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	228
6.3	Regression Analyses for Transformed Dependent Variable Leader-Member Exchange (LMX ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	229
6.4	Regression Analyses for Dependent Variable Leader-Member Exchange (LMX) and Independent Variables Gender, Tenure and Mean-Centered JD, CF, CONSC, NEURO and WLCS	232
6.5	Regression Analyses for Dependent Variable Leader Member Exchange (LMX) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS	233
6.6	Simple Slopes for the Equation for Curvilinear CONSC and LMX Relationship	234
6.7	Regression Analyses for Transformed Dependent Variable Communication Frequency (CF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX	239
6.8	Regression Analyses for Transformed Dependent Variable Communication Frequency (CF ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX	240
6.9	Regression Analyses for Dependent Variable Communication Frequency (CF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX	243
6.10	Regression Analyses for Dependent Variable Communication Frequency (CF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX	244
7.1	Regression Analyses for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX	259
7.2	Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX, and CF	261
7.3	Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX, and CF	262

7.4	Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX, and CF	263
7.5	Regression Analysis for Dependent Variable Emotional Exhaustion (EE) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX, and CF	266
7.6	Regression Analysis for Dependent Variable Transformed Depersonalization (DEP ⁺) and Independent Variables Gender, Tenure and Transformed Mean-Centered JD, CONSC and LMX and Mean-Centered WLCS	268
7.7	Regression Analysis for Dependent Variable Transformed Depersonalization (DEP ⁺) and Independent Variables Gender, Tenure and Transformed Mean-Centered JD, CONSC, LMX and CF and Mean-Centered WLCS	270
7.8	Regression Analysis for Dependent Variable Transformed Depersonalization (DEP ⁺) and Independent Variables Gender, Tenure and Transformed Mean-Centered JD, CONSC, LMX and CF and Mean-Centered WLCS	271
7.9	Logistic Regression Analysis for Dependent Variable Depersonalization and Independent Variables Gender, Tenure, JD, CONSC, NEURO, WLCS, LMX and CF	272
7.10	Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX	274
7.11	Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA ⁺) and Independent Variables Gender, Tenure and Mean-Centered NEURO and WLCS and Mean-Centered Transformed JD, CONSC and LMX	276
7.12	Regression Analysis for Dependent Variable Transformed reduced Personal Accomplishment (rPA ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX, and CF	278
7.13	Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX	280
7.14	Regression Analysis for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX, and CF	282
7.15	Regression Analyses for Dependent Variable Occupational Self-Efficacy (OCCEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX	284
7.16	Regression Analysis for Dependent Variable Occupational Self-Efficacy	286

(OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX, and CF	
7.17 Regression Analyses for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CF, CONSC, NEURO and WLCS	288
8.1 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, and OCCSEFF	298
8.2 Regression Analysis for Dependent Variable Emotional Exhaustion (EE) and Independent Variables Gender, Tenure and Mean-Centered JD, and OCCSEFF	299
8.3 Regression Analyses for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, WLCS and OCCSEFF	301
8.4 Regression Analyses for Dependent Variable Transformed Emotional Exhaustion (EE ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, NEURO, CONSC, WLCS and OCCSEFF	305
8.5 Regression Analyses for Dependent Variable Emotional Exhaustion (EE) And Independent Variables Gender, Tenure and Mean-Centered JD, NEURO, CONSC, WLCS and OCCSEFF	309
8.6 Regression Analyses for Dependent Variable Depersonalization (DEP) and Independent Variables Gender, Tenure and Mean-Centered JD, and OCCSEFF (outlier removed)	311
8.7 Nonparametric Correlation Spearman's Rho for Gender, Tenure, JD, Occupational Self-Efficacy and Depersonalization	311
8.8 Logistic Regression Analysis for Dependent Variable Depersonalization and Independent Variables Gender, Tenure, JD, and OCCSEFF	312
8.9 Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA ⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, and OCCSEFF	313
8.10 Regression Analyses for Dependent Variable reduced Personal Accomplishment (rPA) and Independent Variables Gender, Tenure and Mean-Centered JD, and OCCSEFF	314
8.11 Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD and OCCSEFF	316
8.12 Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, NEURO, CONSC, WLCS and OCCSEFF	317

LIST OF SYMBOLS

a	Unstandardized regression coefficient for the relationship X and M
b	Unstandardized regression coefficient for the relationship M and Y (when X is controlled for)
B	Unstandardized regression coefficient
e	Total effect of X on Y
e'	Direct effect of X on Y after controlling for M
CF	Communication frequency variable
CMV	Common-method variance
CONSC	Conscientiousness variable
$DFBETA$	Influence measured as change in a specific B_i if case omitted from estimate
DEP	Depersonalization variable
EE	Emotional exhaustion variable
F	Statistic used for multiple df numerator and denominator significance tests
JD	Job demand variable
k	Largest possible score of variable + 1
K-S	Kolmogorov-Smirnov statistic
LMX	Leader-Member Exchange variable
m	Number of independent variables
M	A mediating variable
M_x	Mean of X
MBI	Unidimensional burnout measure
Model N	Model with untransformed dependent and independent variables
Model N^+	Model with transformed dependent variable and untransformed independent variables
Model N^{++}	Model with transformed dependent and independent variables
n	Sample size
NEURO	Neuroticism variable
OCCSEFF	Occupational self-efficacy variable
ONS	Office of National Statistics
p	Probability
r	Pearson product moment correlation coefficient
R^2	Squared multiple correlation
$R^2_{Y.AB}$	Squared multiple correlation from sets A plus B of predictors
$R^2_{YB.A}$	Squared partial correlation of set B with Y with set A held
rPA	Reduced Personal Accomplishment variable
S_a	Standard error of a
S_b	Standard error of b

<i>s.d.</i>	Standard deviation
SQRT	Square root
VIF	Variance inflation factor
W_i	Constructed variable
WLCS	Work locus of control variable
X	An independent variable
X^+	Transformed variable
X_H	Value of independent variable at + 1.0 standard deviation
X_L	Value of independent variable at - 1.0 standard deviation
X_M	Mean value of independent variable
\hat{Y}	Predicted score in the unstandardized regression equation
Y_G	Geometric mean of the scores in the untransformed independent variable
Z	An independent variable
z	Standardized variable: variable from which the sample mean has been subtracted and the result divided by the sample <i>s.d.</i>

Greek Letters

α	Cronbach's alpha
β	Standardized regression coefficient
Δ	Change in value
λ	Value used to transform dependent variables
ρ	Spearman rank order correlation
θ	Unstandardized coefficient of the W_i term in the regression equation

CHAPTER 1 INTRODUCTION

1.1 THE IMPORTANCE OF THE TOPICS IN THIS STUDY

Managers and academics recognize the primary importance of employee motivation and performance to organizational outcomes (Bakker, Demerouti & Verbeke, 2004). It has been argued that leadership is central to the dynamics of an organization (Hosking, 1988) and important managerial decisions concern the guidance of employee effort and the use of talent (Wood & Bandura, 1989). A persistent topic of human interest is the pursuit of happiness and well-being (Wright & Cropanzano, 2000). Managers are not only responsible for organizational objectives but have a moral responsibility to their employees to ensure their well-being. As Bass (1981) observes, managers are in a unique position to be able to reduce employee occupational stress through control of factors in the work place that cause distress. Levinson (1980) goes as far as arguing that it is a central function of leadership to anticipate, alleviate and ameliorate the stress of employees. Recently, increased competition in the international environment has led many organizations to implement innovative work practices to improve competitiveness; many of which involve increased employee effort and workload (Hodson & Roscigno, 2004). This will further increase the tension between organizational success through employee performance and employee well-being.

This study examines how job demands, employee perceptions of leadership, communication frequency with their manager and employee personality influence employees' levels of energy depletion, their attitudes to their work, and their judgments of their levels of ability and competence to perform successfully and effectively in their work. The research is conducted through a field study of 128 middle managers in different organizations in the public sector all of whom have a similar job description and are tasked with the achievement of a national government objective through the formulation and leadership of implementation of a local strategy in their respective geographical areas.

The study draws upon and involves consideration of the following theories and concepts: Maslach's (1982) concept of burnout as a psychological phenomenon, the job demands-resource (JD-R) model of burnout (Demerouti, Bakker, Nachreiner & Schaufeli, 2001; Schaufeli & Bakker, 2004), the existential model of burnout (Pines & Aronson, 1988; Pines, 1993), the conservation of resource model (Hoboll, 1989; Hobfoll & Freedy, 1993), Lazarus and Folkman's (1984) cognitive appraisal model of stress, sociocognitive theory and self-efficacy (Bandura, 1986; 1989), LMX theory (see Graen & Uhl-Bien, 1995; Gerstner & Day, 1997), uncertainty reduction theory (Berger & Calabrese, 1975), Albrecht and Adelman's (1987b) communication theory perspective on social support, personality trait theory and the two constructs of conscientiousness and neuroticism from the Big-Five personality factors (Costa &

McCrae, 1992), and social learning theory and the construct of locus of control (Rotter, 1966).

A brief explanation of each of the topics considered in this thesis and their importance is provided below. For a more detailed explanation of the theories and concepts, the reader is referred to the literature review in chapter 2.

1.1.1 Burnout

The concept of burnout as a psychological phenomenon originated through the identification and study of a social problem and not from theoretical considerations (Maslach & Schaufeli, 1993). The American psychologist Herbert Freudenberger is generally considered as the originator of the term “burnout” (Schaufeli & Enzmann, 1998). In 1974, Freudenberger published a paper entitled “Staff-burnout” (Freudenberger, 1974) where the syndrome was described in detail. Freudenberger worked in a care agency in New York and observed that after a period of a year’s service young volunteers who had started with great enthusiasm experienced a gradual depletion of energy and motivation and suffered from a range of mental and physical symptoms. These included exhaustion, the inability to shake off a cold, gastrointestinal disturbances, sleeplessness, depression, increased drug taking, cynicism, withdrawal, outbursts of anger and tearfulness. One of Freudenberger’s prime motivators in studying the syndrome was his own experience of it (Freudenberger & Richelson, 1980).

In 1982, Maslach published her landmark book “Burnout the Cost of Caring” which has offered the most influential definition of burnout to date (Schaufeli & Enzmann, 1998). Maslach conceptualized burnout as being composed of three components of: emotional exhaustion, depersonalization and reduced personal accomplishment (Maslach, 1982). Emotional exhaustion represents a state of depletion of an individual’s emotional and physical resources and is characterized by a feeling of being over-extended (Maslach, 1993). Conceptually emotional exhaustion closely resembles traditional stress reactions (Cordes & Dougherty, 1993; Maslach, 1993). Depersonalization is a measure of the individual’s interpersonal context and represents a negative or detached response by the individual (Maslach, 1993). Reduced personal accomplishment is the self-evaluation dimension of burnout and is characterized by feelings of a decline in competence and a lack of productivity or achievement at work (Maslach, 1993). According to Schaufeli and Enzmann (1998) burnout is a multidimensional syndrome made up of energy depletion and dysfunctional attitudes towards the work place and can be considered as a kind of prolonged stress reaction. Although the original definition was restricted to individuals that worked in people-orientated human service roles it is now considered that individuals working in any kind of occupation are at risk (Demerouti et al, 2001; Maslach, 2003; Maslach & Leiter, 1997; Maslach, Schaufeli & Leiter, 2001).

Maslach and Leiter (1997) posit that there have recently been fundamental changes in the nature of work and this is causing a crisis in employee health and well-being.

They observe that “the work place today is a cold, hostile, demanding environment, both economically and psychologically” (Maslach & Leiter, 1997:1). They argue that burnout is becoming a crisis as individuals in the work place feel overloaded, lacking in control, are not rewarded or receive recognition for their work, suffer from a loss of positive connection with others, are not shown respect or have their self-worth confirmed, and have to deal with conflicting values. They comment that “burnout is reaching epidemic proportions among North American workers” (Maslach & Leiter, 1997: 1) and that “burnout is the biggest occupational hazard of the twenty-first century” (Leiter & Maslach, 2005: 3).

While recognizing that the increases in stress-related illness are in part due as Pollock (1988) argues to raised public awareness of the potential impacts and familiarization with the terms burnout and stress, it should be noted that in Europe occupational stress is now considered as a risk-assessable disease (Clarke & Cooper, 2000). The impact of occupational stress on employee psychological well-being and health are well documented (Clarke & Cooper, 2000) and burnout at work has been found to be extensive and having costly consequences for organizations and individuals (Zellars, Perrewe & Hochwater, 2000). Costs to organizations arise through reduced employee commitment, engagement and performance (Halbesleben, 2006; Hakanen, Bakker and Schaufeli, 2006), increased absenteeism (Neveu, 2007), increased health costs and higher employee turnover (Halbesleben, 2006; Schaufeli and Bakker, 2004). The cost of burnout per annum has been estimated to be \$300 billion to the US economy and £46 billion to the British economy (Leiter & Maslach, 2005).

The cost of burnout to individuals is in terms of the impact on the quality of their lives and to their physical and mental health and well-being (Cox, 1978; Quick & Quick, 1984). Extensive research has found stress to be related to physiological and physical disorders (Cox, 1978). Individuals can be adversely affected through cognitive effects such as the inability to make decisions, lack of concentration, mental blocks and hypersensitivity to criticism, physiological effects such as increased blood pressure and difficulty breathing, and health effects such as coronary heart disease, migraines, neuroses, insomnia, and diabetes (Quick & Quick, 1984). The author first became aware and interested in the devastating impact that occupational stress could have on individual well-being while working in the automotive sector in Japan in the late-1980s when introduced directly to the concept of *karoshi*. The Japanese word *karoshi* means “death from overwork” (Demise, 2005; Meek, 2004; Palumbo & Herbig, 1994). In 1990, Tetsunojo Uehata published his book “When the Corporate Warrior Dies.” Uehata provided a medical definition of *karoshi* as “a condition in which psychologically unsound work processes are allowed to continue in a way that disrupts the worker's normal life rhythms, leading to a build-up of fatigue in the body and accompanied by a worsening of pre-existent high blood pressure and a hardening of the arteries, finally resulting in a fatal breakdown” (Uehata, 1990; cited in Palumbo & Herbig, 1994: 54). The number of deaths in Japan through *karoshi* is well documented (see, for example,

Meek, 2004) and it is considered a serious ethical issue that needs to be addressed through adequate corporate governance (Demise, 2005).

Burnout is a measure of an individual's emotional and physical energy and their attitudes to those they work with and the work itself. It can be considered as a measure of the well-being of the employee in the context of work. Pines (1993) argues that from an existential perspective "the root cause of burnout lies in our need to believe that our lives are meaningful, that the things we do – and consequently we ourselves – are useful and important" (Pines, 1993: 33). She argues that the most emotionally demanding aspect of work is when an individual moves from a belief of being able to make a positive and significant contribution and a high state of motivation to a state of low motivation and energy and a sense that their work and efforts are insignificant and pointless (Pines, 1993). Cooper and Dewe (2005) argue that stress is an important factor in illness and there is a moral responsibility to study this topic. For these reasons and those identified previously the study of burnout is a relevant and important topic.

1.1.2 Self-Efficacy

Maddux (1995) argues that a full understanding of human behaviour requires an understanding of cognition, behaviour and the environment. Self-efficacy (Bandura, 1986; 1989) is a construct derived from sociocognitive theory. A triadic reciprocal causation model is posited where behaviour, cognitions and the environment dynamically influence each other (Bandura, 1986). An individual's perception of their self-efficacy is an assessment of their personal judgement of whether they have the capabilities to organize and execute a course of action to achieve a particular task (Bandura, 1986).

At the heart of self-efficacy theory is "a sense of personal control, mastery or efficacy" (Maddux & Lewis, 1995: 38). Bandura (1989) argues that self-efficacy is important for an individual's well-being as "ordinary social realities are strewn with difficulties" and are "full of impediments, failures, adversities, setbacks, frustrations, and inequities" (Bandura, 1989: 1176). He proposes that a robust sense of self-efficacy acts as a buffer to these day to day frustrations and helps individuals overcome daily challenges, threats and obstacles. He argues that peoples' beliefs in their capabilities affects the level of stress they experience in difficult situations as when individuals believe they can exert control over potential threats they will not be subjected to apprehensive cognitions and be disturbed by them (Bandura, 1989). Individuals who are low in self-efficacy will suffer from higher levels of stress and anxiety arousal as they will fear that they cannot overcome potential threats and will tend to dwell on their coping deficiencies and see many aspects of their environment as fraught with danger (Bandura, 1989).

Prior research has found that self-efficacy is negatively related to mental distress and psychological strain (Jex, Bliese, Buzzell & Primeau, 2001) and depression (Maddux & Meier, 1995). It has also been shown that self-efficacy beliefs make positive

contributions to several components of the physiological stress system, including the sympathetic nervous system, hypothalamic-pituitary-adrenal cortical system and the immune system (O'Leary & Brown, 1995). Cherniss (1993: 135) comments that "most writing and research on burnout has not explicitly recognized the conceptual link between burnout and self-efficacy." This study attempts to address this and adopts each of these concepts as important outcomes for individuals in the context of the work place.

In this dissertation the personal outcomes of burnout and occupational self-efficacy are studied. Although the two outcomes are not directly asymmetric self-efficacy can be considered as a competence in socially valued pursuits such as behavioural skills and capabilities in the work place which are conducive to human attainment and well-being (Bandura, 1995), while burnout relates to a sense of being over-extended and depleted of resources and feelings of a decline in competence and a lack of productivity or achievement (Maslach, 1993). Prior research has consistently found that self-efficacy is positively related to individuals' performance in the work place (Gist & Mitchell, 1992), negatively related to work overload perceptions and psychological strain (Jex & Bliese, 1999). Self-efficacy has also been found to make positive contributions to several components of the physiological stress system (O'Leary & Brown, 1995). In addition, Pines (1993) argues that goal attainment and success are critical antidotes to burnout and the achievement of a sense of existential significance and meaning in our lives.

Self-perception of self-efficacy varies across different activities and tasks (Bandura, 1986) and a distinction must be made between self-efficacy as a general stable personality trait and a situation specific state (Eden & Kinnar, 1991). Cherniss (1993) advises that for professional burnout the role of occupational self-efficacy and not generalized self-efficacy is important. For these reasons, in this study a measure of occupational self-efficacy is used which can be defined as "one's belief in one's own ability and competence to perform successfully and effectively in situations and across different tasks in a job" (Schyns et al., 2005: 3).

1.1.3 Leadership

Leadership is one of the world's oldest preoccupations (Bass, 1981). Recently, there has been an explosion of interest in leadership (Bass & Riggio, 2006) and it has become one of the most discussed, studied and written about topics in social science research (Bligh & Meindl, 2005; Hogan, 2004). In the last half of the 20th century leadership became an area of serious academic investigation (Judge & Bono, 2000) and the study of leadership has become an important and central part of the knowledge of management and organizational behaviour (Yukl, 1989). Leaders are an important source of information for employees and play a significant role in their sense making (Daft & Weick, 1984; Thomas, Clark & Gioia, 1993) and will influence their perceptions of relevant organizational features, events and processes (Kozlowski & Doherty, 1989). An individual's immediate manager is often the most immediate and

salient person in the work place for an employee and likely to have a direct influence on their behaviour (O'Driscoll & Beehr, 1994).

There are many definitions of leadership (Bass, 1981). A few of the more popular definitions include leadership as a trait, a behaviour, an interaction, a relationship, influence over followers, influence over tasks and goals, influence on organizational culture (Yukl, 1989) and skill in organizational activity (Hosking, 1988). Yukl (1989: 279) observes "most of the prevailing theories are simple, unidirectional models of causality that focus on what a leader does to a subordinate." A general leadership style approach is adopted which assumes that leaders behave in the same way to all followers and that the followers are homogenous in terms of their reaction to the leader's influence (Ilies, Nahrgang & Morgeson, 2007). Howell and Shamir (2005) argue that followers play an active role in constructing the leadership relationship and will determine the consequences of the leadership relationship. Graen and Uhl-Bien (1995) agree that leadership is a relationship that is jointly produced by leaders and followers. Meindl (1995) is critical of extant leadership theories as being too leader-centric and argues for a more follower-centric approach. Meindl (1995) argues that it is the individual's perspective of the leader rather than the leader's actual personality and behaviour that influences followers. Kupers (2007) argues that in the study of leadership the role of followers has not been adequately studied while Felfe and Schyns (2006: 709) comment that "we know little about the influence of followers' characteristics on their perceptions of their supervisors." There have been calls for more research focused on followers (Graen & Uhl-Bien, 1995) and on the impact of follower personality on leadership perceptions in field studies in organizational settings (Felfe & Schyns, 2006).

Cordes, Dougherty and Blum (1997) argue that interpersonal interactions are a key construct in the burnout process, while Buunk and Schaufeli (1993: 53) state that "to understand the development and persistence of burnout, attention has to be paid to the way individuals perceive, interpret and construct the behaviour of others at work." Cherniss (1980: 113) suggests that "of all the social interactions that influence job stress and the coping process in human service settings, the relationship between the supervisor and the worker is especially important." In her original book, Maslach (1982) identified that supervisors had a key role in influencing and shaping the nature and role of individuals and commented that "burnout among providers can be hastened or alleviated by supervisory actions" (Maslach, 1982: 45). Other researchers have also identified that where interactions with the manager cause strain to the employee they will be vulnerable to burnout (Cordes et al., 1997; Maslach et al., 2001). Of particular importance is the research of Leiter and Maslach (1988) where it was found that unpleasant contact with the supervisor was an important source of interpersonal stress.

Despite these considerations the research into leadership and burnout has been limited (Halbesleben & Bowler, 2007; Hetland, Sandal & Johnsen, 2007). Seltzer and Numerof (1988) comment that it is difficult to understand why supervisory leadership behaviour has been neglected in the extensive burnout literature. Even in the related

literature of stress little has been written on the effects of different leadership styles on the stress levels of followers (Smith & Cooper, 1994). Halbesleben and Buckley (2004) observe that because supervisors are in a more favourable position to affect stressors that lead to burnout, they are in a more favourable position to provide social support to individuals and identify that in the study of prevention of burnout “more work is needed on the specific nature of resources, and in particular, the role of social support as a resource” (Halbesleben & Buckley, 2004: 874).

For these reasons, this field study focuses on followers and their perceptions of leadership. In particular the study focuses on their perceptions of their leadership relationship with their direct manager and utilizes Leader-member exchange (LMX) theory (see Graen & Uhl Bien, 1995; Gerstner & Day, 1997; Schriesheim, Castro & Cogliser, 1999). LMX theory is unique in that it is the only leadership approach that makes the dyadic relationship between the leader and the follower the pivotal concept in the process of leadership (Northouse, 2004). The main contribution of LMX theory to the understanding of leadership is from its fundamental assumption that leaders form different relationships with each of their subordinates (Sparrowe & Liden, 1997). High-quality exchanges are characterized by mutual trust, respect and reciprocal obligation and high levels of interaction, support and formal and informal rewards. Employees in low-quality LMX relationships receive less resources and support and the relationship is based around the formal job description. The quality of the LMX relationship between an employee and their manager relates to the level of emotional support and valued resources they receive (Sparrowe & Liden, 1997) and is “pivotal in determining the member’s fate within an organization” (Sparrowe & Liden, 1997: 522). LMX has been found to influence employee perceptions of the organizational environment and their attitudes and is increasingly being examined as a process that impacts on key individual outcomes (Davis & Gardner, 2004). Existing research has shown LMX to be an important factor in determining employee well-being (Epitropaki & Martin, 2005).

In the only two studies of LMX and burnout, the author is aware of at the time of writing this dissertation, negative relationships have been found between LMX and burnout. In a study of employees of a medium-sized hospital in the south-eastern United States, Thomas (2005) found that LMX had significant direct and indirect effects on the reduction of emotional exhaustion. In a study of employees of a large institute for higher professional education in the Netherlands, Bakker, Demerouti and Euwema (2005) found that LMX was negatively related to all three components of burnout and moderated the effects of work overload and physical demands on emotional exhaustion. They called for further research to replicate the findings in different settings.

Conger and Kanungo (1988: 473) propose that individuals are empowered when “they believe they can adequately cope with events, situations, and/or the people they confront” and call for further research into empowerment and the concept of self-efficacy. In particular Conger and Kanungo (1988) call for further research into the link between empowerment practices and leadership. Prior research has supported the link

between leadership and empowerment. Supervisor support has been found to enhance employee levels of empowerment (Keller & Dansereau, 1995) and LMX has been found to be positively related to psychological empowerment (Aryee & Chen, 2006). The positive relationship between LMX and self-efficacy has been confirmed in a longitudinal study by Murphy and Ensher (1999) and in studies of German workers by Schyns and von Collani (2002) and Schyns et al. (2005), where a positive correlation between occupational self-efficacy and LMX was found.

Although significant research has occurred on the outcomes of LMX there is limited understanding as to why and how particular characteristics and behaviours, other than initial performance, influence LMX development (Wayne, Liden & Sparrowe, 1994). Although there are sound theoretical reasons to include variables such as follower personality traits (see section 1.1.4 below) as antecedent factors of LMX development (Bauer & Green, 1996; Yukl, 1989) there has been limited research into these factors (Gerstner & Day, 1997; Martin, Thomas, Charles, Epitropaki & McNamara, 2005). This dissertation addresses these issues by studying the relationships between follower personality traits and LMX.

1.1.4 Communication Frequency

Uncertainty reduction theory (Berger & Calabrese, 1975) suggests that when individuals experience a lack of predictability in a situation or with a person they will seek information to reduce the uncertainty. Many authors have argued that communication is a critical element of social support in the reduction of stress in the work place (see, for example, Albrecht & Adelman, 1987b; Fenlason & Beehr, 1994; Ray, 1987). In the limited number of studies available on feedback and burnout the results consistently show that a lack of feedback is positively related to all three components of burnout (Schaufeli & Enzmann, 1998). However, Kramer, Dougherty and Pierce (2004) comment that in the work place the relationships between communication, uncertainty and outcomes are complex and Ray (1987) comments that the relationship between social support and employee well-being is not straightforward.

The constructs of leadership and communication can be considered to overlap (Baker & Ganster, 1985). Communication is the vehicle through which leaders and followers create, nurture and maintain their relationship. Previous empirical studies have indicated that managers spend between one and two thirds of their time communicating with their subordinates and that this is done face to face (Jablin, 1979; cited in Baker & Ganster, 1985). High-quality LMX relationships are bound to effective communication (Yukl, 2006) and are characterized by frequent interaction (Bauer, Erdogan, Liden & Wayne, 2006). An assumption of LMX theory is that a higher quality of communication and a greater quantity of communication is always better. Kramer (2004) questions the assumption that as the amount of communication and interaction between supervisors and subordinates increases there will be increasingly positive outcome for the employees involved and calls for research to explore the quantity of communication that

no longer benefit the LMX relationship and can be detrimental to the subordinate. Further, research by Kacmar, Witt, Zivnuska and Gully (2004) demonstrated that the importance of LMX is dependent on the frequency of interaction between the leader and subordinate and they call for more research on LMX and communication content and patterns.

As there have only been a few studies in this area, the complexity that may be present, the findings that unpleasant contact with the supervisor can be an important source of interpersonal stress (Leiter & Maslach, 1988) and the calls for further research, it is argued that it is important to study the subject of communication frequency and the interactions between communication frequency and the quality of the relationship between the employee and their supervisor further.

1.1.5 Personality

Most business leaders understand the importance of personality (Hogan, 2004) and their perceptions of it influence their decisions about employees (Barrick & Mount, 2005). Although the relationship between personality and job performance has been frequently studied over the past century (Barrick, Mount & Judge, 2001) there have been few studies exploring differences in personality and the impact on burnout (Kahill, 1988; Shirom, 1989; Zellars et al., 2000). In the study of antecedent factors to burnout prior research has focused mainly on role stressors and little attention has been given to personality traits (Bakker, van der Zee, Lewig & Dolland, 2006). This may be because key authors (for example, Cherniss, 1993; Leiter and Maslach, 1988) have commented that environmental factors are more strongly related to burnout than personality variables. Moore (2000: 337) observes that “in general, the research community appears to have reached agreement that individual-difference variables have little direct effect and certainly do not act alone in the occurrence of work exhaustion; rather, job factors appear to be the key predictors.”

Bolger (1990) suggests that personality traits may help to explain why some individuals suffer from stress and others do not. As personality can be considered as the way in which an individual thinks and behaves it has been argued that personality will influence how a person reacts when faced with work place stressors (see, for example, George & Brief, 2004). Two theoretical models that give important consideration to the role of the individual as well as the environment in the etiology of burnout and stress are the conservation of resource model (COR) (Hobfoll, 1989; Hobfoll & Freedy, 1993) and the cognitive appraisal model of stress (Lazarus & Folkman, 1984). The conservation of resource model (Hobfoll, 1989; Hobfoll & Freedy, 1993) recognizes the role of environmental variables and individual cognitive processes and predicts that burnout occurs when individuals feel they do not have the necessary reserves of physical, emotional or status resources to handle job-related stressful events. Research by Wright and Cropanzano (1998) and Wright and Hobfoll (2004) using COR as the theoretical framework gave support to the importance of personality factors in the burnout process.

The contribution of Richard Lazarus to the study of stress is widely recognized (Cooper & Dewe, 2005). Daniels (2001: 802) argues he is “the most influential scholar in this area in the twentieth century.” As burnout can be considered as a prolonged job stress measure (Schaufeli & Enzmann, 1998) and emotional exhaustion conceptually resembles traditional stress reactions (Cordes & Dougherty, 1993) it is surprising that greater attention in the burnout literature has not been paid to the work of Richard Lazarus. In their cognitive appraisal model of stress Lazarus and Folkman (1984) emphasize the importance of an individual’s perceptions as the critical mediating process between environmental demands and outcomes. The model posits that psychological demands do not act as stressors and have negative impacts on mental and physical health unless they are appraised as such. The model also puts a strong emphasis on the role of coping within the stress process. Coping mechanisms are the strategies an individual chooses to deal with a stress event in the work place (George & Brief, 2004). The relationship between coping and burnout has been confirmed (see, for example, Leiter, 1991), and there is a long standing link between personality and coping behaviour in psychology (George & Brief, 2004). Also, it is well known that different individuals will also adopt different coping strategies dependent on their personality (George & Brief, 2004; Payne, 1991; Steptoe, 1991). It seems strange then that there is such a limited amount of research into personality traits as either antecedent factors or moderators in the study of burnout.

Personality psychology uses considerations of traits to predict motivation and behaviour (Hogan, 2004). Mount, Barrick, Scullen and Rounds (2005: 448) describe personality traits as “the characteristics that are stable over time, provide the reasons for the person’s behaviour, and are psychological in nature.” Many researchers agree that there are five major dimensions of personality (Costa, McCrae & Dye, 1991) and recently trait theory has converged on the five-factor model of personality which consists of conscientiousness, neuroticism, extraversion, agreeableness and openness to experience. The two most critical traits for success in the work place are conscientiousness and emotional stability (the reverse of neuroticism) (Stewart & Barrick, 2004). In a meta-analytical review Judge and Ilies (2002) found that conscientiousness and neuroticism were the strongest predictors of performance motivation. Conscientiousness has been found to be the most important trait that managers consider when making employment decisions (Dunn, Mount, Barrack & Ones, 1995). Neurotic individuals tend to view the world through a negative lens (Bono & Judge, 2004) and tend to be emotional and nervous and prone to stress (Stewart & Barrack, 2004). Conscientiousness pertains to feelings of control and emotionally stable individuals (those low in neuroticism) tend to feel in control of their environment (LePine, LePine & Jackson, 2004).

As previously mentioned, Maslach and Leiter (1997) have argued that the burnout crisis is due in part to individuals feeling overloaded and lacking control in the work place. Indeed, Spector, Cooper, Sanchez, Sparks, Bernin, Bussing, Dewe & Hart et al. (2002b) argue that control beliefs are a vitally important element in the management of

organizations. There is significant theory and research evidence to confirm the influential role of perceived control in ameliorating defensiveness and stress reactions (Williams, 1995) and there is strong agreement that when an individual has a sense of control over their own behaviour, environment, and thoughts and feelings they will have a high level of psychological and physical well-being (Maddux & Lewis, 1995). A further deep-personality trait that relates directly to perceptions of control is locus of control (Rotter, 1966). Locus of control is derived from social learning theory (Rotter, 1954) and relates to individual differences in a generalized belief in *internal* versus *external* control of reinforcement. It has consistently been found to be related to performance (Blau, 1993; Howell and Shea, 2001; Judge & Bono, 2001) and to be a strong dispositional predictor of job satisfaction (Judge & Bono, 2001). Although conceptually similar to self-efficacy, the difference is that locus of control is related to the extent to which an individual believes that their behaviour controls outcomes, while self-efficacy relates to the individuals confidence to perform certain behaviours to achieve desired outcomes (Maddux, 1995). Internal individuals have been found to have enhanced coping ability, are resistant to adverse influences and exhibit achievement behaviour (Phares, 1976).

From their review of the literature on work place stress and employee's health Ganster and Schaubroeck (1991) concluded that "personality plays a number of different roles in the etiology of job stress, particularly in relation to job stressors" (Ganster & Schaubroeck; 1991: 259). Zellars et al. (2000) conducted research into the five factors of personality and burnout in nurses. Their findings indicated that personality did play a meaningful role in burnout although some of the hypothesized relationships were not supported. They concluded their paper by calling for further research into the antecedent factors of burnout. It is expected that personality will play an important role in the development of self-efficacy. In a theoretical analysis of the determinants and malleability of self-efficacy Gist and Mitchell (1992) posit that efficacy perceptions are influenced by differences in personality. Walsh (2004) observes that the study of personality and self-efficacy is a neglected area.

Although personality trait theory assumes that our actions can be explained in terms of traits (Hogan, 2004), Barrick and Mount (2005) argue that personality is a distal motivational force and that it will influence behaviour through proximal performance motivation variables such as goals and expectancies. However, it has been found that trait-performance relationships are strongest when employee autonomy is high (Barrick & Mount, 1993) and when normative guidelines for behaviour are absent (e.g. when work place politics is high) (Hochwater, Witt & Kacmar, 2000). These factors are particularly important for this study as it is expected that the individuals in this field study will have high levels of autonomy and a lack of normative guidelines for behaviour. It is predicted that personality will be found to be an important antecedent factor for burnout in this study.

For these reasons it is argued that the study of the personality factors of conscientiousness, neuroticism and locus of control in this thesis is important and will add to knowledge of the antecedent and moderating factors in the understanding of burnout, self-efficacy and LMX.

1.2 THE PURPOSE OF THIS STUDY

The central thesis of this dissertation is that employees' relationships with their manager and their personality will significantly influence their levels of burnout and occupational self-efficacy. The purpose of this study is to investigate this proposition in the context of middle managers responsible for the achievement of strategy formulation and implementation.

1.2.1 Aims and Objectives

The aim of this study is to meet the calls for further research identified in the previous section and to make useful contributions to the understanding of the impact of job demands, employee perceptions of leadership, communication frequency with their manager and employee personality on employees' levels of energy depletion, their attitudes to their work, and their judgments of their levels of ability and competence to perform successfully and effectively in their work.

1.2.2 The Contributions of This Study

A field study was conducted of 128 middle managers having the same role in different organizations within the public sector in the United Kingdom tasked with the achievement of a national strategy within their local area. Data was obtained through an online questionnaire and from the Office of National Statistics and quantitative analysis was undertaken using regression methods. The study was designed and undertaken in an attempt to make the following contributions:

1. The study of leadership and burnout has been limited (Halbesleben & Bowler, 2007; Hetland et al., 2007; Seltzer & Numerof, 1988). This study considers the relationship between the supervisor and the employee as suggested by Maslach (1992). The construct of LMX and the three components of burnout in the Maslach Burnout Inventory (MBI) are used to provide an additional study to the one provided by Bakker et al. (2005) of the impact of LMX and job demands on burnout in a different field-setting. The possibility of negative outcomes for employees in high quality LMX relationships is examined as called for by Harris and Kacmar (2006).
2. In an area where there are only a few studies available on feedback and burnout (Schaufeli & Enzmann, 1998) this study investigates the relationships between communication frequency and the three components of burnout in a different field-setting. The study also examines whether the assumption that more

communication between an employee and their manager is always better for the employee as called for by Kramer (2004).

3. The above investigations are extended to examine the interaction effects between LMX and communication frequency on the relationships with each of the three components of burnout and provides an additional study of the role of social support from the supervisor in the prevention of burnout as called for by Halbesleben and Buckley (2004).
4. In response to Conger and Kanungo's (1988) call for more research into empowerment and leadership, an additional study is provided of the relationship between LMX and occupational self-efficacy in a field-setting. This is extended to include an investigation into the relationship between communication frequency and occupational self-efficacy and investigate interaction effects between LMX and communication frequency in their relationship with occupational self-efficacy.
5. The work of Kacmar et al. (2004) is extended and further research provided into the dependence of the importance of LMX on the frequency of interaction for two previously unexamined employee outcomes of burnout and occupational self-efficacy.
6. As little attention has been paid to the impact of personality traits on burnout (Bakker et al., 2006), this study responds to the call of Zellars et al. (2000) for further investigation into personality factors as antecedents to burnout. It also responds to the call of Buunk and Schaufeli (1993) for further investigation into the moderating role of personality characteristics.
7. In a theoretical analysis of the determinates and malleability of self-efficacy, Gist and Mitchell (1992) argue that efficacy perceptions are influenced by differences in personality. Walsh (2004) comments that there has been limited study of the relationships between personality and self-efficacy. A field study is provided into the relationships between three personality traits of conscientiousness, neuroticism and work locus of control and occupational self-efficacy.
8. In line with the recommendation of Erez and Judge (2001) that a single personality trait is often a poor predictor of performance and personality traits should not be tested in isolation, a three-way interaction between the three personality traits considered in this study and occupational self-efficacy is investigated.
9. In line with the observation of Barrick and Mount (2005) that personality is a distal motivational force that will only influence behaviour through proximal performance motivation variables such as goals, self-efficacy and expectancies and the suggestion of Walsh (2004) that personality and self-efficacy may interact to facilitate well-being, a three-way interaction between occupational

self-efficacy and two of the personality traits considered in this study and burnout and its component of emotional exhaustion is investigated.

10. The study includes traits from the Big-Five with work locus of control for the first time and investigates their relative importance to both burnout and occupational self-efficacy.
11. The study investigates whether follower personality traits are antecedents of LMX as called for by Gerstner and Day (1997) and Martin et al. (2005). It provides an additional study into work locus of control as an antecedent to the limited number of studies and provides a study of conscientiousness and neuroticism as antecedents. The relationship between communication frequency and LMX and the influence of follower personality on this relationship is investigated.
12. It provides an investigation into the relative importance of each of the factors of LMX, communication frequency and the three personality traits to the employee outcomes of burnout and occupational self-efficacy.
13. Further to the work of Martin et al. (2005) it provides an additional field study of the role of LMX as a mediator of the relationship between work locus of control and employee well-being and extends this work for the relationships between conscientiousness and neuroticism. The role of LMX as mediator in the relationship between conscientiousness, neuroticism and work locus of control and occupational self-efficacy is also investigated.

In the subsequent chapters the theory and rationale underlying these considerations is specified in more detail.

1.3 THE DESIGN AND OUTLINE OF THIS THESIS

As this thesis is a reflection of the journey of a novice into the world of academic research in the social sciences, the author decided to carefully account for each and every step made. This has led to a degree of repetition, which the author hopes will be acceptable to the reader, when balanced against the thoroughness of the analyses and the demonstration of the development of the knowledge and understanding of the author. Some further repetition is also inevitable, as each chapter is intended to be to a large extent a stand-alone piece of work. The content of each chapter is reviewed below:

In this chapter, chapter 1, the importance of the topics studied, the purpose of the study, the aims and objectives, and the intended contributions are discussed.

In chapter 2, a brief review of the literature on each of the concepts and theories is provided. The construct of burnout and each of the three components of the Maslach (1982) conceptualization and the relationships between them is reviewed and discussed. Major burnout theories including the existential model of burnout (Pines, 1993), the conservation of resources model of burnout (Hobfoll, 1989; Hobfoll & Freedy, 1993) and the job demands-resource (JD-R) model of burnout (Demerouti et al., 2001; Schaufeli & Bakker, 2004), are discussed. The relationship between burnout and stress is

commented upon and the cognitive appraisal model of stress (Lazarus & Folkman, 1984) is reviewed. Bandura's (1986) theory of self-efficacy is discussed and a model of the self-efficacy-performance relationship as described by Gist and Mitchell (1992) is examined. LMX theory (see Graen & Uhl-Bien, 1995; Gerstner & Day, 1997) is described and reviewed and a range of literature on communication is examined. The relationship between communication frequency and LMX theory is discussed. The concept of personality is discussed, and personality trait theory and social learning theory are reviewed. The relationship between personality and organizational outcomes is examined and a review of the literature on conscientiousness, neuroticism and locus of control is provided.

In chapter 3, the methodology adopted for the study is described. The sample and data collection procedures are discussed and a background provided for the field study. Each of the scales used to measure the variables in the study is considered and an analysis of their reliability and internal consistency is provided. The factor structure of the measures is examined using confirmatory factor analysis. The advantages of hierarchical multiple regression for the analysis of the data are discussed and an overview of the methods for comparing relative effects of variables, testing for curvilinearity, and testing for interaction and moderation effects is described. Three different methods for the testing of mediation effects are also presented and discussed. The sample size in the study is reviewed and the detection of the presence and measurement of influence of outliers is discussed. Univariate and multivariate methods for detection are discussed and an initial analysis is undertaken for potential outliers. The importance of the distribution of variables for hierarchical regression analysis is discussed. An assessment of the normality of the variables is undertaken and possible non-linear transformations are investigated and reviewed. The requirements for normality, linearity and homoscedasticity of residuals and methods to examine and detect violations of these conditions is discussed. The advantages in interpretation of mean-centering the independent variables in the analyses is reviewed. Descriptive statistics of the mean and standard deviations for each of the variables are provided. The issue of multicollinearity is discussed and the steps required to detect and minimize this in the analyses are reviewed. The issue of common-method variance and procedural remedies to control for this effect are discussed. The statistical investigation technique, the Harmon single factor test used to investigate the presence and influence of common-method variance in the analyses is described.

In chapter 4, an investigation of job demands, leadership and communication frequency on the important employee outcomes of burnout and occupational self-efficacy is undertaken. Relevant theory and prior research is reviewed and specific hypotheses are proposed. The relationship between each of the components of burnout and occupational self-efficacy and the relationship between job demands and each of the burnout components are confirmed. The impact of the employees' perception of the quality of the relationship with the supervisor and their communication frequency on

each of the components of burnout and on occupational self-efficacy is investigated. Whether there are possible negative outcomes for employees in high quality LMX relationships as called for by Harris and Kacmar (2006) is investigated. The assumption that more communication between an employee and their manager is always better for the employee as called for by Kramer (2004) is examined. Interaction effects between LMX and communication frequency and the two outcome variables are examined and whether the importance of LMX to outcomes is dependent on communication frequency is investigated. The analyses undertaken are described and the results presented and discussed.

In chapter 5, whether the personality traits - conscientiousness, neuroticism and work locus of control are antecedent factors to burnout and occupational self-efficacy is investigated. Relevant theory and prior research is reviewed and specific hypotheses tested. Whether the personality traits act as moderators in the job demand-burnout relationship as predicted by the cognitive appraisal model of stress (Lazarus & Folkman, 1984) is investigated. A three-way hypothesis is formulated and a three-way interaction term is investigated. The analyses are described and results presented and discussed.

In chapter 6, the relationship between communication frequency and LMX is investigated. Whether the personality traits - conscientiousness, neuroticism and work locus of control are antecedent factors to LMX is investigated and their relative contributions and importance to the quality of the LMX relationship is examined. Relevant theory and prior research are reviewed and specific hypotheses tested relating to both direct effects and moderation and mediation effects. The analyses are described and results presented and discussed.

In chapter 7, the relative importance of each of the variables to the outcomes of burnout and occupational self-efficacy is investigated and the role of LMX as a mediator of the relationships of the personality traits is examined. The impact of partialing out the effects of the other variables present in the study on the major findings from earlier chapters is also assessed. The analyses are described, results presented and findings discussed.

In chapter 8, the importance of occupational self-efficacy for individual well-being is investigated. The impact of occupational self-efficacy on burnout and each of the components is confirmed and whether occupational self-efficacy moderates the relationship between job demand and burnout is also investigated. Following the suggestion by Walsh (2004: 152) that self-efficacy and personality may interact to facilitate well-being and Barrick and Mount's (2005) observation that personality may be a distal motivational force which acts through more proximal motivation variables such as goals, self-efficacy and expectancies a three-way hypothesis is generated from consideration of relevant theory and tested.

Chapter 9 summarizes the results and findings of this study and provides conclusions. The research proposition and achievement of the aims and objectives are reflected upon and a commentary provided on the contributions made. The strengths and

limitations of the study are discussed and ideas for future research possibilities suggested. A review of the practical value of the study and the implications for management practice is provided.

CHAPTER 2

LITERATURE REVIEW

2.1 BURNOUT

The American psychologist Herbert Freudenberger is generally considered as the originator of the concept of burnout (Schaufeli & Enzmann, 1998) after the publication of his paper “Staff-burnout” (Freudenberger, 1974). In this paper Freudenberger provided a detailed description of the syndrome that he observed of young volunteers in a care agency in New York. After a period of a year’s service the volunteers who had started with great enthusiasm, were found to experience a gradual depletion of energy and motivation and suffered from a range of adverse mental and physical symptoms.

Burnout is conceptualized as a psychological syndrome which occurs in response to interpersonal stressors in the work environment (Maslach et al., 2001). It is an individual level phenomenon and can be viewed as a negative emotional experience which is a chronic, ongoing affective response. Burnout is a combination of physical fatigue, emotional exhaustion and cognitive weariness. It is this consideration of the depletion of the individual’s energetic resources that makes burnout unique (Shirom, 1989). Pines and Aronson (1988: 9) state that “burnout is formally defined and subjectively experienced as a state of physical, emotional, and mental exhaustion caused by long-term involvement in situations that are emotionally demanding.” They identify the symptoms as including physical depletion, feelings of helplessness, disillusionment, negative self-concepts and negative attitudes towards work and life itself.

The original definition of burnout was restricted to individuals that worked in people-orientated human service roles but it has been extended to other occupations (Maslach et al., 2001). Shirom (1989) observed that the key components of burnout of physical fatigue, emotional exhaustion and cognitive weariness occur commonly in employees and not just in those who have a large contact with people requiring aid. Individuals working in any kind of occupation may be at risk from burnout (Maslach, 2003). Demerouti et al. (2001) argue that there is little theoretical rationale for limiting burnout to human service professionals and in their research of 374 employees from 21 different jobs in three occupational fields provide empirical evidence that this is the case. Research by Cordes et al. (1997) with human resource professionals confirmed the generalizability of burnout to professionals and managers in a corporate environment.

Burnout is a key construct for the understanding of stress processes in individuals and is related to important negative outcomes for individuals and organizations (Cordes & Dougherty, 1993). Research has found that burnout is related to reduced employee organizational commitment (Hakanen et al., 2006), lower productivity and performance (Maslach et al., 2001), reduced engagement (Hakanen et al., 2006), employee ill-health (Hakanen et al., 2006; Schaufeli & Bakker, 2004), increased absenteeism and depression (Neveu, 2007) and increased turnover intentions (Schaufeli & Bakker, 2004).

People suffering from burnout can also negatively affect their colleagues through increased personal conflict and disruption of job tasks (Maslach et al., 2001).

Pines (1993) argues that a unique characteristic of burnout which differentiates it from other concepts such as stress is that burnout results from a long and gradual process of disillusionment. Pines and Aronson (1988) state that burnout occurs when the daily struggles and frustrations that are typical in the work place, coupled with too many pressures and demands and too few emotional rewards, successes and insufficient support, gradually erode an individual's spirit and energy. Maslach and Leiter (1997) agree that burnout occurs gradually over time and suggest that if an individual starts to suffer burnout it can be a downward spiral from which it is hard to recover.

The most influential definition of burnout has been offered by Maslach (1982) who characterized burnout as being composed of three components of emotional exhaustion, depersonalization and reduced personal accomplishment. This is the definition adopted in this study. Each of the three components is described more fully below.

2.1.1 Emotional Exhaustion

Emotional exhaustion is the most obvious manifestation of burnout (Maslach et al., 2001; Wright & Bonett, 1997). It is a chronic state of emotional and physical depletion and is characterized by feelings of being overextended and exhausted by the emotional demands of work. Emotional exhaustion is defined by Moore (2000: 336) as "the depletion of emotional and mental energy needed to meet job demands." A key symptom of emotional exhaustion is a feeling of dread at the prospect of going into work (Cordes & Dougherty, 1993). Although all three components of burnout are important, it has been argued that emotional exhaustion is the key dimension of burnout (Wright & Cropanzano, 1998). It tends to dominate the relationship of burnout with environmental conditions (Leiter, 1993) and has emerged as the central variable for understanding the burnout process (Cordes & Dougherty, 1993; Cropanzano, Rupp & Byrne, 2003). Of the three components it is the most widely studied and analyzed (Maslach et al., 2001).

Conceptually emotional exhaustion closely resembles traditional stress reactions (Cordes & Dougherty, 1993) and can be conceptualized as a type of strain that results from work place stressors (Demerouti et al., 2001). Of the three components emotional exhaustion is the most similar to stress (Maslach, 1993). Emotional exhaustion has been found to have serious negative consequences for both individuals and organizations. Wright and Bonett (1997: 493) comment that "even minimal occurrences of emotional exhaustion, experienced relatively few times a month, are indicative of substantial activation, which may warrant attention." Previous research has found it to be related to negative health outcomes such as mental health, anxiety and depression (Kahill, 1988), lower levels of commitment (Lee & Ashforth, 1996), reduced work performance (Halbesleben & Bowler 2007; Wright & Bonett, 1997; Wright & Cropanzano, 1998; Wright & Hobfoll, 2004), reduced organizational citizenship behaviour (Cropanzano et

al., 2003; Halbesleben & Bowler 2007; Wright & Hobfoll, 2004) and increased turnover intentions (Cropanzano et al., 2003; Lee & Ashforth, 1996; Wright & Cropanzano, 1998).

2.1.2 Depersonalization

Depersonalization is a measure of the individual's interpersonal context and represents a negative or detached response by the individual (Maslach, 1993). Research across a wide range of organizational and occupational settings has consistently found a strong relationship between emotional exhaustion and depersonalization (Maslach et al., 2001). Emotional exhaustion and depersonalization are generally considered to be the core dimensions of burnout (Demerouti et al., 2001). Depersonalization occurs as a result of the individual's need to cope with emotional exhaustion and protect themselves from the stressors in their work place by disengaging (Lee & Ashforth, 1990). It is characterized by withdrawal and mental distancing from recipients (Demerouti et al., 2001) and development of an indifferent or cynical attitude (Maslach, 1993). Individuals who are high in depersonalization will display emotional callousness and cynicism, are likely to engage in long breaks and extended conversations with co-workers, and may use derogatory language and jargon (Cordes & Dougherty, 1993).

2.1.3 Reduced Personal Accomplishment

The third component, reduced personal accomplishment, refers to the individual's negative self-evaluation of themselves (Maslach, 1993; Wright & Cropanzano, 1998). An individual feels a sense of reduced personal accomplishment when they feel ineffective and incompetent at work and a lack of productivity or achievement (Maslach, 1993). There is a feeling of a lack of progress or even of losing ground (Cordes & Dougherty, 1993). Some authors (Cordes & Dougherty, 1993; Lee & Ashforth, 1990, Wright & Bonett, 1997) have suggested that personal accomplishment can be considered at a theoretical level to be similar to self-efficacy (see section 2.2 below).

2.1.4 The Relationship between the Three Components of Burnout

Originally, Leiter and Maslach (1988) proposed a sequential developmental model of burnout where emotional exhaustion developed first in response to a demanding environment. Depersonalization then developed as a coping mechanism as employees tried to achieve an increased personal distance from the sources of the exhaustion. The increased emotional exhaustion and depersonalization then resulted in a loss of meaning for the work by the employee and this resulted in reduced personal accomplishment.

In his process model of burnout, Leiter (1988) proposed that the relationships between the components of burnout develop in a mixed sequential and parallel manner. The model proposed that depersonalization was a product of emotional exhaustion and the effect of environmental conditions on depersonalization were mediated by emotional

exhaustion. The model predicted that diminished personal accomplishment develops in parallel with emotional exhaustion. In a test of this model, Leiter (1991) found support for the impact of emotional exhaustion affecting depersonalization. Despite the fact that reduced personal accomplishment shared common causes with emotional exhaustion and depersonalization, it was found to develop independently. In a meta-analytical examination of the three dimensions of burnout and their correlates, Lee and Ashforth (1996) found that emotional exhaustion and depersonalization were more strongly correlated with each other than diminished personal accomplishment. Research by Neveu (2007) also found evidence that reduced personal accomplishment develops independently of the other two burnout components. Maslach et al. (2001) comment that the relationship of reduced personal accomplishment to the other two dimensions of burnout is complex.

2.1.5 The Existential Model of Burnout

The existential model of burnout (Pines & Aronson, 1988; Pines, 1993) is a motivational model and argues that people have a need to believe that their lives are meaningful. Many people, particularly in the social services, derive a sense of being useful and having significance through what they do, particularly in their work lives. The model posits that “the root cause of burnout lies in our need to believe that our lives are meaningful, that the things we do – and consequently we ourselves – are useful and important” (Pines, 1993: 33).

An underlying assumption of the existential model of burnout is that only highly motivated individuals will become burnt out. Pines and Aronson (1988) argue that burnout afflicts people who enter their profession highly motivated and expecting to achieve a sense of meaning through their work. Burnout occurs as the daily struggles and frustrations that are typical of the work place gradually reduce an individual’s motivation. They find they are subjected to too many pressures and demands and have inadequate support and resources and experience too few successes and emotional rewards (Pines & Aronson, 1988). The most emotionally demanding aspect of work is when an individual moves from a belief of being able to make a positive and significant contribution and a high state of motivation, to a state of low motivation and energy and a sense that their work and efforts are insignificant and pointless (Pines, 1993).

Goal attainment and success are critical antidotes to burnout (Pines, 1993) and when work is supportive and challenging an individual can achieve peak performance and a sense of meaning, significance and success (Pines & Aronson, 1988).

2.1.6 The Conservation of Resources (COR) Model of Burnout

“The basic tenet of COR theory is that individuals strive to obtain, retain, protect and foster things that they value” (Hobfoll, 2001: 341). This occurs in a world that is by nature threatening and challenging and the individual has to rely on valued resources in

order to survive. Hobfoll (1989: 516) defined resources as “those objects, personal characteristics, conditions or energies that are valued by the individual or that serve as a means for attainment of those objects, personal characteristics, conditions, or energies.” Major resources include social support and job enhancement opportunities such as control, participation in decision-making and autonomy. Major demands include role ambiguity, role conflict, high workload and pressure, and the occurrence of stressful events. COR theory posits that psychological stress occurs in individuals when their resources are threatened with loss, when resources are actually lost or when insufficient gains are made after significant resource investment (Hobfoll, 2001; Hobfoll & Freedy, 1993). In their meta-analysis Lee and Ashforth (1996) found support for the primacy of resource loss argument (Hobfoll & Freedy, 1993) that individuals were more sensitive to demands than the resources received. The COR model predicts that burnout occurs when work demands consume resources at a greater rate than the employee can replenish them and individuals feel they don’t have the necessary reserves of physical, emotional or status resources to handle job-related strain (see also Neveu, 2007; Hobfoll, 2001; Lee & Ashforth, 1996; Wright & Cropanzano, 1998; Wright & Hobfoll, 2004).

The conservation of resources model recognizes the role of environmental variables and individual cognitive processes in the etiology of burnout (Lee & Ashforth, 1996). The theory suggests that motivation of the individual is important within the burnout process. The key is how employees acquire, maintain and manage resources to meet current demands and buffer against resource depletion (Wright & Hobfoll, 2004). The strength of the COR model is its ability to explain the process leading to burnout (Halbesleben & Bowler, 2007) and it has become more important in recent years and gained a great deal of empirical support (Neveu, 2007; Halbesleben & Bowler, 2007).

2.1.7 The Job Demands-Resources (JD-R) Model of Burnout

The job demands-resource (JD-R) model (Demerouti et al., 2001; Schaufeli & Bakker, 2004) attributes well-being of the employee to factors within the work environment. It predicts that high job demands are primarily and positively related to an individual’s emotional exhaustion and job resources are primarily and negatively related to an individual’s disengagement (Bakker et al., 2004). Job demands are defined as “those physical, social, or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological or psychological costs” (Demerouti et al., 2001: 501). Job resources are defined as “those physical, psychological, social, or organizational aspects of the job that may do the following (a) be functional in achieving work goals, (b) reduce job demands and the associated physiological and psychological costs, (c) stimulate personal growth and development” (Demerouti et al., 2001: 501). The model assumes that burnout develops when job demands are high and job resources are limited (Bakker et al., 2005). Research

(Bakker et al., 2004; Bakker et al., 2005; Schaufeli & Bakker, 2004; Hakanen et al., 2006) has shown support for the model.

The possible buffering effect of job resources on the impact of job demands on emotional exhaustion has not received much research attention (Bakker, Demerouti, Taris, Schaufeli & Schreurs, 2003; Bakker et al., 2005). In a study of the buffering effects of four job resources, autonomy, social support from colleagues, the quality of the relationship with the supervisor and the level of performance feedback all buffered the impact of work overload on emotional exhaustion. This study provided strong support for the assertion that high job demands will not result in burnout if employees have adequate job resources.

The original JD-R model focused on the external resources available to the individual and not the individual's internal resources. Xanthopoulou, Bakker, Demerouti and Schaufeli (2007) expanded the model to include personal resources. In a test of the model Xanthopoulou et al. (2007) found that the personal resources of organizational based self-esteem, optimism and self-efficacy played a significant role in explaining changes in emotional exhaustion and disengagement. Personal resources were found to mediate the relationship between job resources and work engagement. They (Xanthopoulou et al., 2007) suggested that the study showed that the availability of job resources activated the employee and made them feel more able to control their work environment. Their findings also indicated another significant process. Previously the JD-R model predicted that job resources had a moderating potential of the job demands-exhaustion relationship (Bakker et al., 2005). Now the findings indicated that job resources can play a more active role in the prevention of emotional exhaustion through the activation of the individual's personal resources.

2.1.8 Burnout and Job Stress

Although burnout is a multidimensional syndrome made up of energy depletion and dysfunctional attitudes at work, it can be considered as a prolonged job stress measure (Schaufeli & Enzmann, 1998). Of the three components emotional exhaustion is the most similar to an orthodox stress variable (Maslach, 1993). Cordes and Dougherty (1993) argue that conceptually emotional exhaustion closely resembles traditional stress reactions and it can be conceptualized as a type of strain that results from work place stressors (Demerouti, et al., 2001).

Because of the similarities between burnout and job stress and in particular the component of emotional exhaustion and stress it is surprising that greater attention has not been paid to the work of Lazarus and Folkman (1984) and their cognitive appraisal model of stress. This model is reviewed below as it has significant implications for the importance of personality variables in the etiology of burnout.

2.1.9 The Cognitive Appraisal Model of Stress

Richard Lazarus has made an enormous contribution to the study of stress (Cooper & Dewe, 2005) and is “arguably the most influential scholar in this area in the twentieth century” (Daniels, 2001: 802). Lazarus found from his work that the way in which one person reacted to a stressful condition was different from that of another person. Lazarus concluded that to understand the process of stress it was necessary to consider “individual differences in motivational and cognitive variables which intervened between stressor and the reaction” (Lazarus, 1993; cited in Cooper and Dewe, 2005: 68).

In their cognitive appraisal model of stress Lazarus and Folkman (1984) emphasize the role of the interaction between the person and the environment and the role of the individual’s perceptions as critical in the mediating process between environmental demands and outcomes. Psychological demands do not act as stressors and do not have negative impacts on mental and physical health unless they are appraised as such. As Lazarus and Folkman (1984: 31) state “cognitive appraisal can be most readily understood as the process of categorizing an encounter, and its various facets, with respect to its significance for well-being.” They make a distinction in the cognitive appraisal process of primary and secondary appraisal. In the primary appraisal process the individual evaluates the question “am I in trouble or being benefited, now or in the future, and in what way?” while in the secondary appraisal process the individual evaluates “what if anything can be done about it?” (Lazarus & Folkman, 1984: 31).

The model suggests that there are three kinds of primary appraisals that can be made: irrelevant, benign-positive and stressful. If the event is evaluated as having no implication for well-being it is appraised as irrelevant. If the outcome is evaluated as preserving or enhancing well-being it is appraised as a benign-positive event. A stressful event involves harm or loss, threat or challenge. In the case of harm or loss, damage may have been caused through the occurrence of the event. An evaluation of threat occurs when it is expected that harm or loss will occur. The evaluation of a challenging event implies the potential for gain but requires the mobilization of coping efforts. Threat and challenge are distinct constructs but are often related and can occur simultaneously. When the encounter with the event unfolds the relationship between threat and challenge may shift. The primary cognitive appraisal is influenced by the individual’s perceptions of the event and these are influenced by factors such as their problem-solving skills, social competence, and other skills they may have.

Secondary appraisal involves an evaluation of what might and can be done. It is a complex evaluatory exercise that involves consideration of coping options, an evaluation of the likelihood that the selected option will succeed and the individual’s assessment that they will be able to implement the proposed strategy successfully. These two different expectancies of outcome and efficacy are also emphasized by Bandura (see section 2.2 below). The outcome expectancy refers to the individual’s evaluation that the chosen behaviour or strategy will lead to desired outcomes while an efficacy

expectation refers to the individual's belief that they can execute the behaviour or strategy successfully and achieve the desired outcome. Thus, the secondary appraisal process involves both an evaluation of the individual's assessment of their capacities and resources in relation to the demands of the situation.

An individual's cognitive appraisals will be influenced by their personal factors. Lazarus and Folkman (1984) identify beliefs and commitments as two important factors. An individual's beliefs relate to how a person sees the environment and shape their understanding. They are important in determining how an individual evaluates events and outcomes. Commitments are those items that are important to an individual. They relate to aspects that have meaning for an individual and refer to the goals and values they have and influence the choices they make.

Lazarus and Folkman (1984: 141) define coping as the "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person." They make a distinction which they "believe is of overriding importance, namely, between coping that is directed at managing or altering the problem causing the distress," *problem-focused coping*, and "coping that is directed at regulating emotional response to the problem," *emotion-focused coping* (Lazarus & Folkman, 1984: 150).

Emotion-focused forms of coping are cognitive processes directed at the reduction of emotional distress and can include avoidance, distancing, selective attention, positive comparisons, and the taking of positive viewpoints through cognitive reappraisal of negative events. Avoidance, distancing and selective attention can involve both positive and negative aspects. Behavioural strategies may involve engaging in physical exercise, meditation, consumption of alcohol, the venting of anger or seeking emotional support. Cognitive reappraisal is a positive strategy where although the objective situation is not changed the encounter is construed in a more positive way. The threat is diminished by changing the meaning of the situation. Examples given by Lazarus and Folkman (1984: 150) are "I decided there are more important things to worry about" and "I decided I didn't need him as much as I thought." Emotion-focused coping can be a mechanism where hope and optimism are maintained through acting as if the event had not happened or mattered, the individual refusing to acknowledge the situation in terms of both the facts and the implications. While there is no sharp dividing line between a healthy individual and slight social illusion, and pathological forms of major distortions of reality, it is clear that major forms of distortion will have long-term costs to an individual (Lazarus & Folkman, 1984).

Problem-focused forms of coping are similar to strategies used for problem-solving and are directed at efforts to defining the problem, generate alternative solutions, evaluation of alternative solutions in terms of costs and benefits, choosing among them and acting. Problem-focused coping is not only directed at the problem and the environment but also inwardly. For example, they can be directed at motivational and cognitive changes in the individual. These may include changes in aspirations and

challenges set by the individual, a reduction in their ego involvement, the consideration and selection of other avenues for gratification, the development of new standards of behaviour, and the learning of new skills and procedures (Lazarus & Folkman, 1984).

2.2 SELF-EFFICACY

Social cognitive theory is an approach to understand human cognition, action, motivation, and emotion. It assumes that people are capable of self-reflection and self-regulation and that they will shape their environments rather than just react to them (Maddux, 1995). Self-efficacy (Bandura, 1986; 1989) is a construct derived from sociocognitive theory. A triadic reciprocal causation model is posited, where behaviour, cognitions and the environment dynamically influence each other (Bandura, 1986). Self-efficacy beliefs are important determinants of individual's motivation, affective state and actions (Bandura, 1989) and "influences individual choices, goals, emotional reactions, effort, coping and persistence" (Gist & Mitchell, 1992: 186).

Bandura (1995: 2) states that "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute courses of action required to manage prospective situations. Efficacy beliefs influence how people think, feel, motivate themselves and act" (Bandura, 1995: 2). An individual's perception of their self-efficacy is an assessment of their judgment of whether they have the capabilities to organize and execute a course of action to achieve a particular task (Bandura, 1986).

Self-efficacy theory suggests that it is the individual's beliefs rather than what is objectively the case that influences their motivation, affective state and actions (Bandura, 1995). Four main sources of information are posited as influencing an individual's efficacy beliefs: previous performance and achievement (mastery experiences), vicarious experience of observing the performance of others, verbal and other forms of social persuasion from which people judge their capabilities, and their psychological or emotional state (Bandura, 1986; 1995). Previous performance and experience is the most influential source of information in affecting an individual's self-efficacy (Bandura, 1995). Verbal forms of persuasion generally have a weak influence on an individual's judgments of their self-efficacy and it is more difficult to instil high beliefs through persuasion than it is to undermine them (Bandura, 1995). For verbal or other forms of social persuasion to have influence it must be provided by someone whom the individual respects and considers as credible and expert (Bandura, 1986).

Gist and Mitchell (1992), in a theoretical analysis of self-efficacy and its determinants present a simplified view of the process of self-efficacy formation. Gist and Mitchell build upon Bandura's (1986, 1989) work and emphasize the importance of three types of assessment processes in the development of the individual's judgement of self-efficacy. These are the analysis of task requirements, an attributional analysis of experience, and an assessment of personal and situational resources and constraints. Analysis of task requirements involves a determination of the requirements needed to perform at a desired level and will be more explicit if the task is novel. The attributional

analysis of experience involves judgements as to why performance occurred in the past. The analysis of task requirements and the attributional analysis of experience should provide the individual with a sense of what is required to do well in the task in terms of ability and motivation. Gist and Mitchell (1992) argue that while these two processes will provide useful information they will not be sufficient to allow the formation of self-efficacy. They argue for the importance of the third assessment, that of the self, the setting and the availability of specific resources and constraints for performance of the task. They state that the assessment will require “consideration of personal factors (e.g. skill level, anxiety, desire, available effort) as well as situational factors (e.g. competing demands, distractions) that impact on performance” (Gist & Mitchell, 1992: 190).

Efficacy beliefs regulate human functioning through cognitive, motivational, affective and selection processes which operate in concert rather than isolation (Bandura, 1995). Most human behaviour is regulated by forethought (Bandura, 1995). Through forethought, individuals anticipate likely outcomes and consequences of their proposed actions and set goals and plans to achieve desired outcomes (Bandura, 1986). Individuals with a high sense of self-efficacy will visualise positive possibilities and guidelines for performance. Those with low self-efficacy will be inclined to visualize negative scenarios that will undermine their performance by consuming energy and reducing their motivation. They will tend to dwell on how things might go wrong and will suffer from self-doubt (Bandura, 1995). Cognitive processes will also be involved in the processing of information to undertake problem-solving. People who have confidence in their ability to solve problems use their cognitive resources more effectively than those who doubt their cognitive ability and intellectual capacity (Maddux & Lewis, 1995). Individuals with high self-efficacy will remain task-orientated and able to maintain a high quality of analytical thinking when faced with adverse conditions and demands, while those with low self-efficacy will suffer from erratic thinking and low cognitive performance (Bandura, 1995). Self-efficacy can be a source of strong motivation and has both a direct and indirect effect on performance through goal choice and commitment (Bandura, 1986). Individuals with high efficacy are more active and persistent in overcoming difficulties and challenges (Bandura, 1986). Those low in efficacy tend to slacken their efforts when faced with obstacles and will lower their aspirations and settle for less satisfactory solutions (Bandura, 1995). Self-efficacy affects individuals’ thought patterns and may be helpful or hindering (Bandura, 1989). In summary, high self-efficacy leads to better performance as individuals set higher goals for themselves, are more persistent, have greater cognitive efficiency, will search more for solutions to problems, and are more likely to remain task-focused and engage in search for solutions rather than become self-diagnostic and reflect on personal inadequacies (Maddux & Lewis, 1995).

Empirical studies have consistently found that self-efficacy is positively related to individuals’ performance in the work place (Gist & Mitchell, 1992; Judge & Bono, 2001; Prussia, Anderson & Manz, 1998; Roberston & Sadri 1993; Stajkovic & Luthans,

1998). It has been found to be positively related to skill acquisition (Mitchell, Hopper, Daniels, George-Falvy & James, 1994), initiative taking (Speier & Frese, 1997), managerial idea generation (Gist, 1989), the use of analytical strategies to discover effective decision rules that contributed to managerial performance (Wood & Bandura, 1989; Wood, Bandura & Bailey, 1990), and organizational commitment (Jex & Bliese, 1999).

In terms of employee outcomes self-efficacy has been found to be related to job satisfaction (Jex & Bliese, 1999; Judge & Bono, 2001; Judge, Bono & Locke, 2000) and positively related to learning (Martocchio & Judge, 1997). Individuals with high self-efficacy have been found to be confident and effective decision makers (Maddux & Lewis, 1995), to be able to sustain a productive attention focus and the perseverance of effort required to succeed (Wood & Bandura, 1989), and to perceive situations as less stressful (Wright & Hobfoll, 2004).

There is strong agreement amongst psychologists that when an individual has a sense of control over their behaviour, environment, and thoughts and feelings it is good for their psychological and physical well-being (Maddux & Lewis, 1995). Bandura (1995: 1) contends that a “strong sense of efficacy in socially valued pursuits is conducive to human attainment and well-being.” He argues that self-efficacy is important for individual well-being as “ordinary social realities are strewn with difficulties” and are “full of impediments, failures, adversities, setbacks, frustrations, and inequities” (Bandura, 1989: 1176). A robust sense of self-efficacy acts as a buffer to day to day frustrations and helps individuals to overcome obstacles. When individuals are able to overcome the challenges that are a part of daily living they suffer less stress and are more able to build healthy relationships, achieve personal satisfaction and peace of mind (Maddux & Lewis, 1995).

An individual’s belief in their capabilities influences how much stress and anxiety they suffer in demanding or threatening circumstances (Bandura, 1989). Individuals with high efficacy beliefs view challenging events as less threatening than those low in self-efficacy. The stronger the self-efficacy perception the bolder people will be in tackling stressful situations and adapting them to favourable outcomes (Bandura, 1995). Individuals with low self-efficacy will suffer from higher levels of stress and anxiety arousal due to their fear that they cannot overcome potential threats and challenges and will tend to dwell on their coping deficiencies and see many aspects of their environment as fraught with danger. Low self-efficacy is associated with despondency and inaction (Maddux & Meier, 1995; Williams, 1995). When individuals have a diminished belief that they can exercise adequate coping responses they tend to become preoccupied with their own deficiencies and possible dangers they face (Williams, 1995). The belief that they are unable to control potentially adverse or harmful events gives rise to anxiety (Williams, 1995).

Findings by Jerusalem and Mittag (1995) suggest that individuals low in self-efficacy are more prone to self-doubts, have higher perceptions of coping deficiencies

when facing difficult situations and have higher levels of anxiety arousal. They tend to worry more, have weaker task-specific competence expectancies, feel more responsible for failure rather than success, regard feedback as an evaluation of personal value rather than performance value and are more likely to interpret psychological arousal as indicative of anxiety rather than excitement. Other research has found self-efficacy to be negatively related to work overload perceptions and psychological strain (Jex & Bliese, 1999) and negatively related to mental distress (Jex et al., 2001). Maddux and Meier (1995) comment that research generally indicates that inefficacy beliefs are strongly associated with depression and O'Leary and Brown (1995) comment that positive self-efficacy beliefs have been shown to make positive contributions to several components of the physiological stress system, including the sympathetic nervous system, hypothalamic-pituitary-adrenal cortical system and the immune system. The subject of self-efficacy and well-being can be summarized by the observation of Maddux and Lewis (1995) that strong beliefs about personal ability and competence result in adaptive emotional states, while low efficacy beliefs lead to distressing emotional states and cognitive and behavioural ineffectiveness.

2.2.1 Occupational Self-Efficacy

An individual's perception of their self-efficacy will vary across different activities and tasks (Bandura, 1986). A distinction must be made between self-efficacy as a general stable personality trait and a situation-specific state (Eden & Kinnar, 1991). Occupational self-efficacy can be defined as "one's belief in one's own ability and competence to perform successfully and effectively in situations and across different tasks in a job" (Schyns et al., 2005: 3). Cherniss (1993) recommends that in the study of burnout, occupational self-efficacy and not generalized self-efficacy needs to be considered. In this study the construct of occupational self-efficacy is utilized.

2.3 LEADER-MEMBER EXCHANGE (LMX)

LMX theory (see Graen & Uhl-Bien, 1995; Gerstner & Day, 1997; Schriesheim et al., 1999) is one of the main theoretical approaches to the study of leader-follower relationships (Liden, Bauer, & Erdogan, 2004). It is unique in that it is the only leadership approach that makes the dyadic relationship between the leader and the follower the pivotal concept in the leadership process (Northouse, 2004). It acknowledges the role of the follower in the leadership process and emphasizes the role of both the leader and follower in terms of their impact on the leadership relationship (Howell & Shamir, 2005). The primary contribution of LMX theory to the understanding of leadership is from its fundamental premise that leaders form different relationships with each of their subordinates (Sparrowe & Liden, 1997). The central premise of LMX theory is that effective leadership processes occur when leaders and

followers develop positive relationships and gain access to the benefits that these relationships provide (Graen & Uhl-Bien, 1995).

LMX research developed from the Vertical Dyad Linkage Approach (Cashman, Dansereau, Graen, Haga, 1976; Dansereau, Graen & Haga, 1975). This research found that contrary to traditional approaches to the study of leadership at the time, (the Ohio State and Michigan studies) which involved an average leadership style, managers were found to develop different relationships with each of their subordinates. As managers have limited time and resources they can only develop and support a limited number of close relationships and high-quality exchanges with a few key subordinates (Graen & Uhl-Bien, 1995). It was originally hypothesized that there were two groups of subordinates, an *in-group* characterized by high-quality relationships and an *out-group* characterized by low-quality relationships. In-group employees receive high levels of opportunity, valued resources, and autonomy, and more of the leader's time and support (Graen & Uhl-Bien, 1995). In return, they invest extra effort and are committed to the advancement of the leader's agenda. They will look for innovative ways to do this, and are prepared to do more than their job description (Northouse, 2004). In low-quality relationships employees receive few resources from their manager. The relationship tends to be based on the employment contract, there is little attempt by the leader to motivate the employee and communication tends to be downwards and unidirectional (Graen & Uhl-Bien, 1995). The employee does what is required of them, and little more, and will engage in low levels of citizenship behaviour and extra-role activity (Northouse, 2004). Graen and Uhl-Bien (1991) suggest that high-LMX relationships develop in three stages: a stranger phase, an acquaintance phase and a mature partner phase. The transition through the stages is characterized by development of progressively greater mutual trust, respect and obligation for each other as each party reciprocates to the initial offers and investments from the other (Graen & Uhl-Bien, 1995).

Dienesch and Liden (1986) argued from a theoretical perspective that LMX could be measured as a continuous variable and was a multidimensional construct. They posited that there were three dimensions to the exchange relationship, namely *perceived contribution*, *loyalty* and *affect*. *Perceived contribution* refers to the perception by each party of the quality and amount of effort the other person invested into the relationship and achievement of the shared goals and was argued to have the largest effect. *Loyalty* refers to the expression of public support for the other person and the shared goals. *Affect* refers to the mutual affection each person has for the other based on interpersonal attraction rather than work or professional values. Later a fourth dimension of *professional respect* was added by Liden and Maslyn (1998). Using the multidimensional LMX scale LMX-MDM strong empirical support has been found for these four dimensions (see, for example, Liden & Maslyn, 1998; Maslyn & Uhl-Bien, 2001).

Graen and Uhl-Bien (1995) argue that the LMX relationship is based on the perceptions of the working relationship, professional capabilities and behaviours and not on interpersonal attraction. They identify three dimensions of *mutual trust*, *respect for the capabilities of the other* and *obligation*. They argue that “LMX has multiple dimensions, but these dimensions are so highly correlated they can be tapped into with the single measure of LMX” (Graen & Uhl-Bien, 1995: 237) and recommend the use of a unidimensional measure of LMX, the LMX-7 (Graen and Uhl-Bien, 1995). Research by Maslyn and Uhl-Bien (2001) found that the LMX-7 and the LMX-MDM were highly correlated ($r = .77$). LMX-7 was correlated with each of the four dimensions of the LMX-MDM of affect, loyalty, contribution and professional respect at $r = .70$, $r = .69$, $r = .46$ and $r = .66$, respectively. In a meta-analytical review Gerstner and Day (1997) found that the LMX-7 provided the soundest psychometric properties and recommended it as the best measure for the assessment of overall exchange quality. In this study the LMX-7 measurement instrument is used.

Interestingly, despite the fact that LMX is considered as relational and reciprocal, the correlation between LMX measured from the member perspective and the leader perspective is low. Gerstner and Day (1997) found a correlation between leader and member reports of LMX of .29. More recently, research by Greguras and Ford (2006) in a sample of 422 matched supervisor-subordinate dyads found the correlation to be $r = .40$ ($p < .05$). The findings of Gerstner and Day (1997) suggested that LMX is more reliably assessed from the member’s perspective than that of the leader.

LMX theory posits that the quality of the leader-member relationship will influence personal and organizational outcomes (Greguras & Ford, 2006). There is a large body of research that supports the positive effects of high-quality LMX relationships. Employees who consider themselves to be in high-quality LMX relationships have been found to assume greater responsibility and contribute more than those in low-quality LMX relationships (Liden & Graen, 1980) and perform at a higher level (Schriesheim, Neider & Scandura, 1998). Research has found LMX to be positively related to in-role performance (Greguras & Ford, 2006; Janssen & van Yperen, 2004), higher performance ratings by the supervisor (Dunegan, Duchon & Uhl-Bien, 1992; Dunegan, Uhl-Bien & Duchon, 2002), innovation performance (Janssen & van Yperen, 2004), organizational citizenship behaviour (Deluga, 1994; Epitropaki & Martin, 2005; Greguras & Ford, 2006; Ilies et al., 2007; Wayne & Green, 1993; Wayne, Shore & Liden, 1997) and safety citizenship behaviour (Hofmann, Morgeson & Gerras, 2003). LMX has also been found to be positively associated with goal commitment and sales performance (Klein & Kim, 1996). Mean LMX has been found to be related to team potency and reduced team conflict (Boies & Howell, 2006) and employees who perceive themselves to be in high-quality LMX relationships have been found to be less likely to file grievances (Cleyman, Jex & Love, 1995).

LMX has been found to influence employee perceptions of the organizational environment and their attitudes and is increasingly being examined as a process that

impacts on key individual outcomes (Davis & Gardner, 2004). Significant research has found that LMX is positively related to positive employee outcomes. For example, employees in high-quality LMX relationships have higher levels of autonomy in their roles (Schriesheim et al., 1998), are able to engage in higher levels of participation (Nelson, Basu & Purdie, 1988), and have higher levels of job involvement (Greguras & Ford, 2006). Research has found that employees in high-quality LMX relationships are more satisfied (Deluga & Perry, 1991), have higher levels of satisfaction with their supervisor (Greguras & Ford, 2006; Schyns & Croon, 2006), have higher levels of job satisfaction (Epitropaki & Martin, 2005; Erdogan, Kraimer & Liden, 2004; Janssen & van Yperen, 2004; Schriesheim et al., 1998), higher levels of career satisfaction (Erdogan et al., 2004) and have lower turnover intentions (Gerstner & Day, 1997).

The level of subordinate liking of the supervisor has been found to be positively related to LMX quality (Engle & Lord, 1997; Liden, Wayne & Stilwell, 1993) as has the level of work value congruence (Erdogan et al., 2004). LMX has been found to be positively related to justice perceptions (Erdogan, Liden & Kraimer, 2006) and perceptions of organizational support (Wayne et al., 1997). Epitropaki and Martin (2005) found that LMX was positively related to employee well-being and Sparrowe and Liden (1997) comment that the quality of the LMX relationship between an employee and their manager relates to the level of emotional support and valued resources they receive and is “pivotal in determining the member’s fate within an organization” (Sparrowe & Liden, 1997: 522).

A small number of studies have found that employees in a middle group of LMX relationships have the most positive personal outcomes (Kramer, 1995; Vecchio & Gobel, 1985) and it has been suggested that the relationship between LMX and stress may be curvilinear (Harris & Kacmar, 2006).

Prior research has also supported a link between LMX and self-efficacy. In a longitudinal study Murphy and Ensher (1999) found that LMX was positively related to self-efficacy. In studies of German workers Schyns and von Collani (2002) and Schyns et al. (2005) found a positive correlation between occupational self-efficacy and LMX.

2.4 COMMUNICATION FREQUENCY

Conventional wisdom is that a higher level of open communication is associated with more positive outcomes for an individual (Kramer, 2004). A number of authors argue for the importance of communication as a fundamental requirement for well-being (Albrecht & Adelman, 1984; van Dierendonck, Hayes, Borrill & Stride, 2004). It is also argued that individuals have a fundamental need for commodities such as social support, status and control of resources and will engage in social interactions to pursue these goals (Hogan, 2004). Hogan and Shelton (1998) suggest that three well-supported conclusions of human motivation are that people desire status, power and control and fear losing them, people want to live in a predictable and stable environment and have a fear of uncertainty, and people have a need to be liked and fear being criticized or

rejected. (See section 2.1.6 The Conservation of Resources (COR) Model of Burnout (Hobfoll, 2001; Hobfoll & Freedy, 1993) for a further discussion of individuals' fear of losing valuable resources).

In their communication theory perspective on social support Albrecht and Adelman (1987b) posit that social support is a communication phenomenon. They argue that people engage in supportive interactions in a search for human contact and in a search for meaning and an attempt to make sense of their circumstances. They define a successful interaction as one in which support occurs and the individual realizes understanding that reduces uncertainty. This reduction in uncertainty provides the individual with a sense of mastery and control over stressors they face and results in a closer feeling of bonding between the two people in the interaction. Albrecht and Adelman (1987b) provide the following definition of the process of social support: "social support refers to verbal and nonverbal communication between recipients and providers that reduce uncertainty about the situation, the self, the other, or the relationship, and functions to enhance a perception of personal control in one's life experience" (Albrecht & Adelman, 1987b: 19).

Uncertainty Reduction Theory (URT) (Berger & Calabrese, 1975) suggests that when individuals experience a lack of predictability in a situation or with a person they will seek information to reduce the uncertainty. If an employee does not receive sufficient or timely information it will lead to unpredictability in terms of goals, performance, consequences, role behaviours, relationships and resource availability. Employees may seek information and support from a range of people from either within or outside of their work environment. Ray (1987) argues that supervisors and co-workers are in a better position to provide support to an employee than friends, family or others outside of work due to their knowledge of stressors in the work place, which are often subtle and overt in nature. These arguments have been supported by prior research. For example, it has been found that individuals are active seekers of feedback information (Ashford & Cummings, 1983), managers are a frequent source of performance feedback for individuals (Andrews & Kacmar, 2001) and individuals are more active in seeking feedback from superiors than their employees or peers (Ashford & Tsui, 1991).

Ashford and Tsui (1991) argue that active feedback seeking by an individual is a central part of the process of self-regulation to achieve effectiveness in the work place. Potential benefits of seeking feedback for an individual are "(a) more accurate signals with regard to goal prioritization; (b) reduced uncertainty with regard to issues surrounding goal attainment; and (c) a better basis for improving his/her own competence" (Barner-Rasmussen, 2003: 42). Role ambiguity has been found to be an important antecedent factor to the development of burnout (Cordes & Dougherty, 1993) and feedback has been found to have a strongly negative correlation with role ambiguity (Jackson & Schuler, 1985). Also, work place communication has been found to play an active role in the job-stress process (Fenlason & Beehr, 1994). There are only a few

studies available on feedback and burnout (Schaufeli & Enzmann, 1998). In a meta-analysis of six studies, feedback was found to be positively related to all three components of burnout (Pfennig & Husch, 1994; cited in Schaufeli & Enzmann, 1998: 83).

But the picture does not seem to be so straightforward. Relationships at work are an important factor in individual health and can be a source of support or stress (Maslach, 1982; Pines & Aronson, 1988). In the work place individuals will be exposed to both rewarding and empowering relationships, and manipulative and negative relationships (Davis & Gardner, 2004). Research by Basch and Fisher (2000) in a study of hotel chain employees found that personal contact and interaction with their manager led to feelings of disappointment, frustration, anger and hurt more often than difficult customers, work pressure or personal problems. Research by Liden and Maslach (1988) found that unpleasant supervisor contact was a source of stress for the individual and was important in the development of emotional exhaustion. But even when the relationship with the supervisor is positive due to the power inherent in the supervisor's role, interactions may have risks for the individual. Individuals who have high levels of uncertainty and regularly communicate this to their manager are likely to be considered unfavourably (Ray, 1987). Albrecht and Adelman (1987c) comment that the need for support to reduce uncertainty can be two-edged sword and while there can be benefits to the interaction there can also be high costs. They identify issues of impression management, identity management, incurred relational costs and difficulties in balancing incompatible relationships. For example, if there are strong norms for behaviour, individuals may feel that it is necessary to respond as expected in the interaction and mask their true feelings. If, in the interaction, the other party expresses an adverse opinion of the individual, such as a comment on a weakness, then this may reduce the individual's self-esteem and perceptions of personal control. If the interaction itself is uncertain or there is even a slight concern that the other's reaction may be negative then the individual may become stressed about the interaction itself (Albrecht & Adelman, 1987c).

It is also possible for communication to increase uncertainty. This can occur if the new information that is revealed is inconsistent with the prior knowledge (Planalp & Honeycutt, 1985). In personal relationships this can occur if competing relationships or deceptions are discovered, changes in personality or values are noticed, or betrayals or failures are revealed. Research by Planalp and Honeycutt (1985) into communication in interpersonal relationships found that individuals had little trouble recalling communication interactions that increased uncertainty in interpersonal relationships. In a replication study (Planalp, Rutherford & Honeycutt, 1988) this finding was confirmed and they also found that there were negative relational consequences from the majority of the uncertainty-increasing incidents.

Research by Kramer et al. (2004) found that not all employees responded as predicted by Uncertainty Reduction Theory (URT) (Berger & Calabrese, 1975) to seek

more information to reduce uncertainty. Their findings suggested that some individuals may reduce uncertainty through cognitive processes (reference to the Lazarus and Folkman (1984) Cognitive Appraisal Model of Stress in section 2.1.9 above). They also found that whilst communication reduced uncertainty, this did not lead to more positive attitudes in employees or a reduction in their stress levels. This led them to comment that the relationships between communication, uncertainty and outcomes in the work place are complex. Research by Buunk and Schaufeli (1993) also supports the finding that employees may not always seek information to reduce uncertainty. They found that stressed individuals did not have a typical desire for upward information.

2.4.1 LMX and Communication Frequency

The predominant perspective of communication in the leadership process is that of persuasion of the follower by the leader as being the most important aspect (Campbell, White & Johnson, 2003). LMX theory emphasizes that effective leadership is contingent on effective leader-follower exchanges, and directs attention to the importance of two-way communication in the leadership process. Research by Mueller and Lee (2002) confirmed that employee satisfaction with communication is positively related to the quality of the LMX relationship.

LMX theory suggests that intra-dyadic communication is essential for LMX development (Graen & Uhl-Bien, 1995). Communication is the vehicle through which leaders and followers create, nurture and maintain their relationship. Recent research by Lam, Huang and Snape (2007) confirmed that feedback-seeking behaviour of employees is positively related to the quality of the LMX relationship, but only when the supervisor interpreted the feedback seeking from the employee as being directed more at performance-enhancement than by impression management motives. High-quality leader-member exchanges are bound to effective communication (Yukl, 2006: 155) and are characterized by frequent interaction (Bauer et al., 2006). Individuals in high- quality LMX relationships receive more information (van Dam, Oreg & Schyns, 2008) and the tone will be more positive than in low-LMX relationships (Dienesch & Liden, 1986). In low- quality LMX relationships the supervisor is more likely to use positional power and authority (Fairhurst & Chandler, 1989) and there is little attempt by the leader to motivate the employee. Communication tends to be downwards and unidirectional (Graen & Uhl-Bien, 1995) and less cooperative (Lee, 2001).

Kramer (2004: 186) questions the assumption that seems inherent in LMX research that as the amount of communication and interaction between supervisors and subordinates increases there will be increasingly positive outcome for individuals involved and calls for research to explore the quantity of communication and participation that no longer benefit the LMX relationship and can be detrimental to the subordinate.

2.5 PERSONALITY

The study of personality is concerned with understanding the nature of humans. While behaviourists believe that people's behaviour is dependent on the environment rather than the kind of people they are and that people are almost infinitely plastic, personality theory suggest that there are limits to people's flexibility. Hogan (2004) observes that organizations are made up of people and "maximizing organizational outcomes requires knowing something about people, which means knowing something about personality psychology" (Hogan, 2004: 4). In this thesis two personality theories are drawn upon: personality trait theory and social learning theory of personality. Each is discussed below.

2.5.1 Personality Trait Theory

Personality trait theory argues that traits are neuropsychic structures that exist inside individuals; our personality can be described in terms of traits and our actions can be explained in terms of traits (Hogan, 2004). Mount et al. (2005: 448) describe personality traits as "the characteristics that are stable over time, provide the reasons for the person's behaviour, and are psychological in nature." Lessons from the person-situation debate of personality and social psychology suggest that a person's traits can alter the situation, individuals will select situations that match their traits and traits will only predict behaviour in certain situations and this will be strongest when situational cues are weak (Stewart & Barrick, 2004). Trait-performance relationships have been found to be strongest when employee autonomy is high (Barrick & Mount, 1993) and when normative guidelines for behaviour are absent (e.g. when work place politics is high) (Hochwater et al., 2000). Barrick and Mount (2005) argue that personality should be considered as a distal motivational force that will influence behaviour through proximal motivation variables such as goals and expectancies.

2.5.2 Social Learning Theory

Social learning theory (Rotter, 1954) states that generalized expectancies are important to explain behaviour in uncertain and ambiguous situations. The theory predicts that an individual's actions are predicted on the basis of their values, expectations, and the situation they find themselves in (Lefcourt, 1976). In social learning theory an important assumption is that the accurate understanding and prediction of individual's behaviour requires consideration of both personal and environmental factors and that the consideration of traits alone is insufficient. The focus for the study of personality is the interaction between the individual and their *meaningful* environment (Phares, 1976). The qualification of *meaningful* is added to emphasize that individuals respond to their environment in a subjective way based on their perceptions, specific learning histories and experiences. The theory assumes that human behaviour is purposeful and that individuals will strive to attain goals that they desire and avoid situations and circumstances that they find undesirable. Where an event or stimulus acts

in the same direction as an individual's goal-directed behaviour it is considered as having a positive *reinforcement*. A *reinforcement* is something that affects the occurrence, direction or kind of behaviour. Behaviour will not only be determined by the nature and importance of the goals or reinforcements, but also by the individual's expectancy that they can be achieved. Social learning theory is a theory of how choices are made by individuals from the variety of potential behaviours available to them (Phares, 1976). Phares (1976: 14) states that "to determine which behaviour has the strongest potential for occurrence, one must consider expectancy, reinforcement value, and the psychological situation."

2.5.3 The Relationship between Personality and Organizational Outcomes

The relationship between personality and job performance has been frequently studied over the past century (Barrick et al., 2001). Two distinct periods can be identified, from the 1900's to the mid-1980's, and from the mid-1980's to the present. In the first of these, researchers used individual scales and the conclusion was that personality and job performance across situations were not meaningfully related. A possible explanation for this conclusion is that there was a lack of clarity about what was being measured and no classification system was available to reduce the thousands of traits into a smaller, more manageable number (Barrick et al., 2001). In the second period many researchers came to agree that there are five major dimensions of personality (Costa et al., 1991). Hogan (2004) comments that the development of the five-factor model was an important event in the history of personality psychology as it provided a taxonomy of trait terms. Research using this model proved to be useful and confirmed the relationship between personality and performance (Barrick et al., 2001). Although there is not universal agreement on the five-factor model of personality it is considered to be a useful taxonomy and is considered one of the most useful for conducting personality research, particularly for the development of specific hypotheses about predictive constructs in the work environment (Barrick et al., 2001). It consists of *conscientiousness*, *neuroticism*, *extraversion*, *agreeableness* and *openness to experience*.

Meta-analytical analyses of the Big-Five personality dimensions and job performance has found that conscientiousness and emotional stability (the opposite of neuroticism) are the only traits that reliably predicted job performance and work behaviour in a wide number of settings (Barrack & Mount, 1991; Barrick et al., 2001; Salgado, 1997). The other three personality traits of extraversion, agreeableness and openness to experience have been found to be valid predictors of performance, but only in specific settings (Barrick & Mount, 2005). Conscientiousness and emotional stability have also been found to have incremental validity over general mental ability in the predication of job performance (Salgado, 1998). In a meta-analysis of the relationship between the five-factor model and performance motivation Judge and Ilies (2002) found conscientiousness and emotional stability to be the strongest predictors and most consistent correlates with performance motivation. Stewart and Barrick (2004: 64)

comment that “conscientiousness, and to a lesser extent emotional stability, are the traits that tend to be elicited by successful employees and are most critical for success across work settings.”

Control beliefs are important to the management of organizations (Spector et al., 2002), are influential in the amelioration of stress (Williams, 1995) and relate to individual well-being (Maddux & Lewis, 1995). Locus of control (Rotter, 1966) derived from social learning theory, is a fundamental personality characteristic that refers to individual differences in a generalized belief in *internal* versus *external* control of reinforcement (Rotter, 1966). It is one of the most often used psychology constructs in empirical research (Antonovsky, 1991) and has been found to be an important predictor of performance and well-being. In a meta-analysis Ng, Sorensen and Eby (2006) found that locus of control is positively related to a broad range of work outcomes and commented that an individual’s locus of control plays an important role in the work place and has at least the same if not greater predictive power for work outcomes than the Big-Five personality traits. Also, research by Chui, Chien, Lin and Hsiao (2005) found that locus of control is an important moderating variable in the study of employee-organization fit. In a meta-analytical review Judge and Bono (2001) found that locus of control and emotional stability were among the best dispositional predictors of job satisfaction and performance. For these reasons, the personality traits of conscientiousness, neuroticism and locus of control are included in this study. Each is reviewed further in the next sections.

2.5.4 Conscientiousness

The six facets of conscientiousness are competence, order, dutifulness, achievement striving, self-discipline and deliberation (Costa et al., 1991). Competence refers to the individual being capable, sensible and accomplished. Order is the tendency for the individual to keep their environment tidy and well-organized. Dutifulness refers to a tendency to observe principles and standards. Achievement striving refers to the need and motivation of the individual to succeed. Self-discipline refers not to self-control but primarily to persistence and perseverance in tasks and to be able to continue with a task despite boredom, distraction or frustration. Deliberateness refers to the aspects of caution, planning and thoughtfulness.

Individuals high in conscientiousness tend to be dutiful, self-disciplined, organized, ambitious, hardworking, persistent, efficient at carrying out tasks, and achievement-orientated (Barrick & Mount, 1993; Spangler, & Palrecha, 2004). Individuals with high conscientiousness set ambitious goals and work hard to achieve those (Stewart & Barrick, 2004). Those low in conscientiousness tend to be easy-going, less exacting on themselves and others, negligent, disorganized, lazy and aimless (Barrick & Mount, 1993; Spangler et al., 2004). Costa et al. (1991) conceptualized conscientiousness as having both proactive and inhibitive aspects. The proactive aspect

is the need for achievement and commitment to work, while the inhibitive aspect refers to moral scrupulousness and cautiousness.

Conscientiousness has been found to be a reliable predictor of job performance and work behaviour in a wide number of settings (Barrack & Mount, 1991; Barrick et al., 2001; Salgado, 1997), found to be related to performance motivation (Judge & Ilies, 2002), and found to have incremental validity over general mental ability in the predication of job performance (Salgado, 1998). For example, conscientiousness has been found to predict sales performance growth (Thoresen, Bradley, Bliese & Thoresen, 2004). Conscientiousness is positively related to leadership behaviour (Judge, Bono, Ilies & Gerhardt, 2002) and research has confirmed that conscientiousness is the most important trait that managers consider when making employment decisions (Dunn et al., 1995).

2.5.5 Neuroticism

Neuroticism or emotional stability is one of the most enduring personality concepts in psychology (Judge, van Vianen & De Pater, 2004). The six facets of neuroticism (Costa & McCrae, 1992; cited in Spangler et al., 2004: 255) are anxiety, angry hostility, depression, self-consciousness, impulsiveness and vulnerability. Individuals who are high in neuroticism tend to worry about unpleasant situations and react negatively to unexpected events and take a long time to return to a normal emotional state (Spangler et al., 2004). They tend to be stress prone, emotional, nervous, irritable and lacking in self-confidence. Individuals who are high in neuroticism tend to view the world through a negative lens (Bono & Judge, 2004). Neuroticism has been found to be negatively correlated to job satisfaction (Judge & Bono, 2001; Judge, Bono & Locke, 2000).

Emotional stability (the opposite of neuroticism) has been found to be a strong and consistent predictor of performance motivation (Judge & Ilies, 2002). Neurotic individuals are less interested, have less energy, and lack in confidence. This results in a lack of achievement striving (Stewart & Barrack, 2004). As previously mentioned, emotional stability (the opposite of neuroticism) is a reliable predictor of job performance and work behaviour in a wide number of settings (Barrack & Mount, 1991; Barrick et al., 2001; Salgado, 1997). Individuals who are high in neuroticism tend to be nervous, suffer from high levels of worry are emotional and insecure and have feelings of inadequacy. Those who are emotionally stable tend to be calm, secure and relaxed and are hardier emotionally (Costa, Busch, Zonderman & McCrae, 1986). Prior research has found neuroticism to be related to all three components of burnout (see, for example, Bakker et al., 2006).

2.5.6 Locus of Control

Locus of control is a fundamental personality characteristic referring to individual differences in a generalized belief in *internal* versus *external* control of reinforcement (Rotter, 1966). Individuals with a high internal locus of control, *internal individuals*, see themselves as active agents and believe that they are masters of their own fate and trust

in their capacity to influence the environment. Individuals with an external locus of control, *external individuals*, see themselves as passive agents and believe that the events in their lives are due to uncontrollable forces such as chance and powerful others. Prior research has shown locus of control to be a stable attribute of a person (Lefcourt, 1976). Although locus of control is similar to self-efficacy expectancy, it is concerned with the extent to which an individual believes that their behaviour controls the outcomes while self-efficacy is about confidence in their ability to perform certain behaviours (Maddux, 1995).

There has been a significant amount of research into the relationship between locus of control and performance in a variety of situations. A consistent finding is that high internal individuals are associated with higher performance in organizations at an individual level (Boone, Brabander & van Witteloostuijn, 1996; Blau, 1993; Howell & Shea 2001; Judge & Bono, 2001; Lefcourt, 1976; Ng et al., 2006) and at a group level (Boone, van Olffen & van Witteloostuijn, 2005). Research into the relationship between chief executive officer (CEO) locus of control and small medium enterprise (SME) organizational performance (Boone et al., 1996; Miller & Toulouse, 1986) found that CEO locus of control is an important predictor of small firm performance. An important finding of Boone et al. (1996) was that internal CEOs achieved higher organizational performance irrespective of strategy content. This suggests that internal CEOs are more able to implement strategy than external CEOs.

Internal individuals are more perceptive and prepared to learn about their environment (Boone et al., 1996; Miller & Toulouse, 1986). They are more inquisitive and curious and are more efficient at processing information (Lefcourt, 1976). Internal individuals are more likely to be persistent in the face of adversity because they believe they can control their environment. They are also likely to perform in ambiguous and stressful situations that entail uncertainty (Boone et al., 2000). Locus of control has been found to be related to leadership (Hiers & Heckel, 1977) and internal individuals have been found to be more likely to emerge into the leadership role (Anderson & Schneier, 1978). Internal and external managers have been found to adopt different management styles (Howell & Avolio, 1993). In a sample of business-unit managers of a large financial institution, Howell and Avolio (1993) found that internal managers showed more transformational leadership than external managers. Internal managers tended to use persuasion to influence the behaviour of subordinates, while externals relied more on coercion. Internal leaders have been found to be rated as more persuasive and influential by their subordinates than external leaders and have higher levels of employee satisfaction (Johnson, Luthans, & Hennessey, 1984).

In the role of followers internal individuals have been found to be more satisfied with a participatory management style than external individuals (Mitchell, Smyser & Weed, 1975) and a positive relationship has been found between locus of control internality and the use of positive upward influencing tactics such as the use of reasoned argument (Ringer & Boss, 2000). Internal individuals are more resistant to influence and

control than external individuals and are more discriminating about the influences that they will accept (Lefcourt, 1976). This is because internal individuals believe they are agents of their own destiny. They resist influence attempts from other people that differ from their own values and beliefs and respond only to those in whom they are in accord. An internal locus of control has been found to be negatively related to cynical beliefs about human nature, and the acceptability of using manipulation to achieve personal goals (O'Conner & Morrison, 2001). External individuals have been found to be more likely to engage in aggressive, manipulative, exploiting and devious methods in order to achieve personal objectives (Gable & Dangelo, 1994) and to react to normal organizational frustrations through sabotage, aggression and withdrawal (Storms & Spector, 1987). Research by Anderson and Schneier (1978) found that internal individuals tended to remain calmer, gave support to others and formed coalitions, whilst external individuals tended to be more critical and showed more emotion. In a meta-analytical review Judge and Bono (2001) found internal locus of control to be positively correlated to job satisfaction.

Extensive prior research has shown that external individuals are more vulnerable and suffer higher levels of stress (see, for example, James & Wright, 1993; Spector, 1986). In their meta-analytical review of locus of control at work Ng et al. (2006) found that internal locus of control was positively related to mental and physical well-being in individuals. Internal individuals are able to cope with failure better than externals (Lefcourt, 1976), are more resilient and do not consider defeat as a final state (Lefcourt, 1976), are more proactive and engage in positive coping strategies (Wanberg, 1997), and will take active steps to initiate and maintain social relationships in times of need (Fusilier, Ganster & Mayes, 1987). Storms and Spector (1987) found that externals are more likely than internals to react to normal organizational frustrations through withdrawal. An external locus of control has been found to be related to anxiety, depression, general feelings of hopelessness and unhappiness (Lefcourt, 1976). Spector, Cooper and Aguilar-Vafaie (2002a) found that internal individuals reported less strain, more job satisfaction and a lower level of intention to quit.

2.5.7 Work Locus of Control

Belief in personal control can be regarded as both a broad generalized belief and as a situation-specific expectancy that is influenced by situational factors (Phares, 1976). Where a high level of predictability is required Phares (1976) and Daniels and Guppy (1992) recommend that a domain-specific measure of locus of control should be utilized. This is further supported by Fisher (1980) who recommends the use of occupational measures to increase predictive validity when considering relationships between personality measures and performance outcomes in the work place. For these reasons in this study the domain-specific generalized control belief in the work setting of work locus of control (Spector, 1988) is used. Blau (1993) posits that this measure

has a better conceptual fit to work-related outcomes than more general scales of locus of control such as Rotter's (1966) scale.

An internal work locus of control has been found to be related to positive perceptions of organizational climate and an individual's levels of commitment and morale (Furnham & Drakeley, 1993). It has also been found to be positively related to lower perceptions of levels of job stressors and strains (Siu, Salgado & Ma, 2004; Spector, Sanchez), to lower stress and strains (Spector, 1988; Spector et al., 2002a; Spector et al., 2004), to mental well-being (Siu, Spector, Cooper, Lu & Yu, 2002; Spector, Cooper, Sanchez, O'Driscoll, Sparks, Bernin, Bussing, & De Moraes et al., 2001) and to employee work-related well-being (Martin et al., 2005). Research by Kalbers and Fogarty (2006) of internal auditors found that work locus of control was an important antecedent for burnout and internality was negatively related to all three components.

CHAPTER 3

METHODOLOGY

3.1 SAMPLE AND DATA COLLECTION PROCEDURES

3.1.1 Background to the Field Study

In 1997, teenage birth rates in the UK were twice as high as in Germany, three times as high as in France and six times as high as in the Netherlands. There were around 90 000 teenage pregnancies in England and around 56 000 live births (Social Exclusion Unit, 1999). Teenage pregnancy was seen as a key inequality and social exclusion issue and economic arguments were put forward for the need to tackle the problem. For example, the cost of teenage pregnancy to the national health service (NHS) is estimated to be around £63 million per year (Teenage Pregnancy Unit, 2006).

In 1999, Tony Blair, then Prime Minister of the United Kingdom, presented to parliament a white paper on teenage pregnancy (Social Exclusion Unit, 1999). In the foreword he stated that: “Britain has the worst record on teenage pregnancies in Europe. It is not a record in which we can take any pride. Teenage mothers are less likely to finish their education, less likely to find a good job, and more likely to end up both as single parents and bringing up their children in poverty. The children themselves run a much greater risk of poor health and have a much higher chance of becoming teenage mothers themselves. Our failure to tackle this problem has cost the teenagers, their children and the country dear” (Social Exclusion Unit, 1999: 4).

The paper set out a ten-year strategy with two main goals to be achieved by 2010:

1. to reduce the rate of teenage conceptions in England by 50%.
2. to reduce the risk of social exclusion of teenage mothers by increasing the proportion of them in education, training or employment to 60%.

Funding for the first three years of £60 million was provided with extra money available from central government to help key initiatives in local authorities with higher rates. New structures were put in place to coordinate activity both at a national level and local level. At a national level an implementation unit was established, led by the Department of Health, and an independent national advisory group was formed to advise government and monitor success of the strategy. At a local level there was to be: “an identified local co-ordinator to pull together all the local services that have a role in preventing teenage pregnancy or supporting those that become parents” (Social Exclusion Unit, 1999: 9). This person was to be identified and in post by the end of 1999 and would be responsible for development of the strategy to achieve the targets.

It is the individuals in these posts that are the subject of this field study. Their task was to coordinate all of the local services targeting the prevention of teenage pregnancy or supporting teenage parents, to consult with the local community, to obtain funding for implementation and co-ordination and to obtain additional funding in high-rate areas (Allen, Barrett, Birdthistle, Bonell, Brooker, Dennison, Fenton, French et al., 2005). By

late 2001 around 97% of local area authorities had a coordinator in post (Allen et al., 2005).

At the time of the study the strategy was seen to be working, with the England under-18 conception rate having declined 11.1% between 1998 and 2004 to the lowest level for twenty years (Department for Education and Skills, 2006). Spending on the strategy was estimated to be saving £4 of public money for every pound invested when assessed over a five-year period. However, success by area was variable with some areas showing reductions by over 42% whilst in other areas rates had increased by as much as 43%.

Areas with similar characteristics were found to have wide variation in performance. Evaluation of the strategy by an independent research team from the London School of Hygiene and Tropical Medicine, University College London Medical School and the British Market Research Bureau (Allen et al., 2005) found that a crucial component of the strategy was the achievement of joint working between the many government departments in each area and that this seemed to be largely attributable to the energy of individual local coordinators. The research team analyzed conception rates in relation to an assessment of the quality of local teenage pregnancy strategies and found no clear association. Expenditure as reflected by the size of Local Implementation Grant (LIG) awards per 1000 females was found to be strongly related to the magnitude of the reduction in under-18 conception rates. Of the £90 million contributed by the government in the period 1999 to 2004, £72.2 million was in the form of LIGs. A further £77.6 million mainstream funding was provided from other government initiatives to give an overall spend of £167.6 million for the first four years.

The importance of the local coordinators to the success of the Teenage Pregnancy Strategy is emphasized by the findings of the research team and their statement that: “the research has shown that teenage pregnancy coordinators have been the lynchpin in the successful implementation of the strategy, galvanizing local activity, engaging in media advocacy, effecting cross-working and generating additional funds by forming collaborative alliances with agencies with similar goals” (Allen et al., 2005: 77). In 2004, the average salary level for local coordinators was around £31,000 and they are considered as middle management (Allen et al., 2005).

3.1.2 Data Collection

The author acknowledges the invaluable assistance and contribution of Mrs. K Betteridge who provided the research access, collected the survey data utilized in this dissertation and provided explanation of the context. Data was obtained from two sources: from an online survey of individuals in each of the local authorities involved in the British Government’s Teenage Pregnancy Strategy considered to be in a coordinator role and from the Office of National Statistics, (ONS). At the time of the study the number of people working on the teenage pregnancy strategy in coordinator roles was not exactly known. Five years into the strategy there was a range of different situations

across the 148 local authorities. Whilst most had appointed a single coordinator, others had used the central government funding to appoint more than one coordinator based on their local geographic requirements. Some local authorities were known not to have a coordinator. It was estimated that there were around 171 coordinators in post at the time of the study.

The people in coordination roles for which details were known were contacted and provided with a statement of the aims of the research and an invitation to complete an online questionnaire. The initial communication requested a fourteen-day period for completion. A follow-up reminder was sent to those people who had not responded after seven days. One hundred and twenty eight coordinators completed the questionnaire. This represents a response rate of 74.3% of the estimated total. Of the respondents 85.2% were female and 14.8% were male, 87.5% had worked with their current line manager for more than 3 three months.

Historical teenage pregnancy statistics for each local authority area were obtained from the Office of National Statistics. To check for nonrespondent bias, an examination was conducted of whether the local area authorities from where coordinators responded differed from those that did not have respondents. A Mann-Whitney U test was used to check whether there was a significant difference in the achievement of target and the first half of 2005 under-18 conception results for the two groups. The z value for the under-18 conception rates was $-.068$ and the asymptotic significance (two-tailed) was $.946$. For the achievement of targets the z value was $-.750$ and the asymptotic significance (two-tailed) was $.453$. In both cases the p value is above $.05$. Therefore, the result is not significant; and it is indicated that there is not a significant difference between the two groups.

3.2 MEASURES

The scales used to measure each variable in the study are discussed and reviewed below (see appendix 3.1 for a copy of the questionnaire). The reliability and internal consistency of each scale was checked by examining the Cronbach's alpha coefficient. Hair, Black, Babin, Anderson and Tatham (2006: 137) state that a value above $.7$ indicates reliability. With reference to table 3.1 below it can be seen that all scales used had a Cronbach's alpha coefficient above this minimum value, indicating reliability and an acceptable level of internal consistency.

3.2.1 Burnout

The respondents level of burnout was measured using the 22-item Maslach Burnout Inventory (MBI) (Maslach & Jackson, 1981). The MBI scale has demonstrated high internal consistency and test-retest reliability (Lee & Ashforth, 1990) and is the most "universally used" scale to assess burnout (Schaufeli & Enzmann, 1998: 50). On the basis of the recommendation of Maslach and Jackson (1986; cited in Lee & Ashforth, 1990) only the frequency format was used. Responses were gathered on a 0 to 6 Likert-

type scale. For each item, response 0 represented the lowest level of burnout, while response 6 represented the highest level. For instance, a sample item is “*I feel emotionally drained from my work*”. Responses for the sample items were: 0. Never; 1. A few times per year; 2. Monthly; 3. A few times per month; 4. Every week; 5. A few times per day; 6. Every day. For each of the separate dimensions of burnout the Cronbach’s alphas were: emotional exhaustion $\alpha = .88$, depersonalization $\alpha = .74$ and reduced personal accomplishment $\alpha = .88$.

TABLE 3.1 Cronbach’s Alpha Coefficients for Each Scale

Scale	Number of Items	Cronbach’s Alpha
Emotional Exhaustion (EE)	9	.88
Depersonalization (DEP)	5	.74
reduced Personal Accomplishment (rPA)	8	.88
Occupational Self-Efficacy (OCCSEFF)	19	.89
Burnout (MBI)	22	.86
Leader-Member Exchange (LMX)	7	.93
Communication Frequency (CF)	4	.87
Conscientiousness (CONSC)	9	.76
Neuroticism (NEURO)	8	.81
Work Locus of Control (WLCS)	16	.84

The mean values for emotional exhaustion, depersonalization and reduced personal accomplishment in this study were 14.6, 1.73 and 13.5, respectively. This compares to corresponding mean values of 23.5, 8.03, and 11.73 reported from analysis of 76 studies in the United States published between 1979 and 1998 (Schaufeli & Enzmann, 1998: 61). The value of emotional exhaustion in this study is closer to the level reported in Schaufeli and Enzmann’s (1998) analysis for one study of senior executives ($n = 224$) of 15.1. The value of reduced personal accomplishment is very close to one of the highest values reported of 13.45, for seven samples in social services ($n = 1631$) (Schaufeli & Enzmann, 1998: 61). In a comparison of burnout profiles between the US and the Netherlands Schaufeli and Enzmann (1998: 62) found that levels of emotional exhaustion and depersonalization were higher in the US than in the Netherlands, whereas levels of reduced personal accomplishment were lower. This is consistent with the findings in this study.

Dimensionality of Burnout

Although the MBI is regarded as the “gold standard” for the measurement of burnout (Schaufeli & Taris, 2005) its structural validity is not beyond question (Densten,

2001; Kalliath, O'Driscoll, Gillespie & Bluedorn, 2000; Schaufeli, Enzmann & Girault, 1993) and many studies have been conducted to investigate the factorial structure of the MBI in a variety of settings (Taris, Schreurs & Schaufeli, 1999). The three-factor model has generally been found to be supported (Taris et al., 1999) (see, for example, Bryne, 1993; Lee & Ashforth, 1990; Richardsen & Martinussen, 2004; Schaufeli & van Dierendonck, 1993) although some studies have also found support for other factor structures. For example, Cordes et al. (1997) found that a two-factor structure with emotional exhaustion and depersonalization combined into a single factor fitted the data as well as the three-factor structure while Kalliath et al. (2000) found support for a two-factor conceptualization of burnout including only emotional exhaustion and depersonalization. Also, in two studies one of teachers by Bryne (1993), and one of Dutch nurses by Schaufeli and van Dierendonck (1993), whilst finding support for the three-factor structure, two items (Q12 and Q16 corresponding to rPA 4 and EE 8, respectively in this study) were found to be problematic with high cross-loadings. To confirm the factor structure of the MBI measure in this study and to investigate whether any of the items were problematic, a confirmatory factor analysis was conducted.

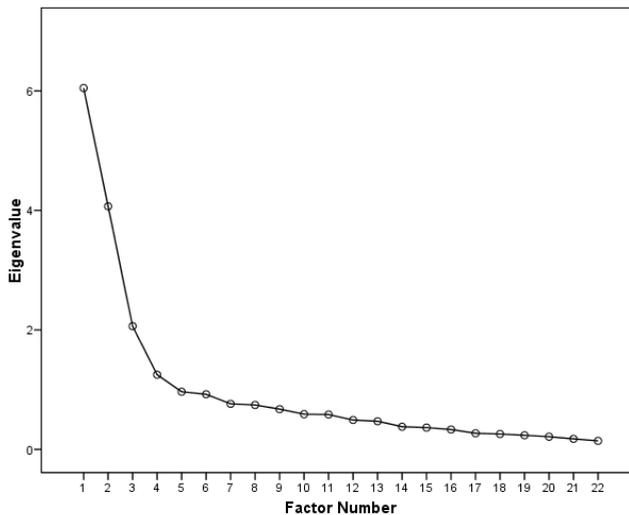
Factor Analysis of Burnout

Hair et al. (2006: 112) state that the sample size for factor analysis should be a minimum of 50 and preferably at least 100. They give a general rule of a minimum of 5 times as many observations as the number of variables, and state that a more acceptable sample size would be 10 observations per variable. For the MBI there are 22 variables and 128 observations in this study. This exceeds the minimum (50) and preferable (100) sample sizes required, and is between the rule of thumb values of the 5:1 ratio (110 samples) and 10:1 ratio (220 samples). As a method to determine the appropriateness of factor analysis Hair et al. (2006: 114) recommend examination of the entire correlation matrix using Bartlett's Test of Sphericity to statistically test for the presence of correlations among the variables. A significant result above .05 indicates sufficient correlations amongst variables to proceed. The value for the Bartlett's Test of Sphericity was found to be significant ($p < .001$), which indicates that factor analysis is appropriate. However, Tabachnick and Fidell (2007: 614) state that Bartlett's test of sphericity is notoriously sensitive and is only recommended for use if there are less than 5 cases per variable. As the number of cases in this study exceeds this value of 110 cases, a further test was conducted. Tabachnick and Fidell (2007: 614) suggest a more sophisticated test using Kaiser's measure of sampling adequacy, with a value of .6 and above as required for good factor analysis. Hair et al. (2006: 114) comments that measures of sampling adequacy can be interpreted as follows: .80 or above, meritorious; .70 or above, middling, .60 or above, mediocre; .50 or above miserable; and below .50 unacceptable. The Kaiser's measure of sampling adequacy was found to be .81.

The most commonly used technique to determine the number of factors to be extracted is the Kaiser or latent root criterion (Hair et al., 2006: 119). Only factors

having latent roots or Eigenvalues above one are considered as significant. In this analysis four factors recorded Eigenvalues above one (6.047, 4.068, 2.062 and 1.250) and explained a total of 61.04 % of the variance. Pallant (2006: 183) suggests that often when using the Kaiser criterion too many factors are extracted and that it is therefore important to inspect the scree plot. A scree test was conducted and the plot is shown in figure 3.1. Hair et al. (2006: 120) state that the maximum number of factors to extract is indicated by the point at which the curve begins to straighten out. The scree plot begins to straighten out after the first three components, indicating that three factors should be retained.

FIGURE 3.1 Scree Plot for MBI



A further way of determining the number of factors to retain is to conduct a parallel analysis (Pallant, 2006: 184). Parallel analysis is a more objective alternative to the scree test and is recommended as a preferred method for determining the number of factors to be extracted (Hubbard & Allen, 1987). In a comparison of methods, Zwick and Velicer (1986) found parallel analysis to be the most frequently accurate method examined. It involves the comparison of the size of Eigenvalues to those of a randomly generated data set of the same size, and retaining the factors with Eigenvalues greater than those from the random data set. Software developed by Watkins (2000) was downloaded and used to conduct the parallel analysis. The output is compared to the Eigenvalues from the factor analysis in table 3.2. Again, it is indicated that three factors should be retained.

TABLE 3.2 Comparison of Eigenvalues from Factor Analysis and Corresponding Values from Parallel Analysis for MBI

Component Number	Actual Eigenvalues from PCA	Criterion value from parallel analysis	Decision
1	6.047	1.828	retain
2	4.068	1.679	retain
3	2.062	1.567	retain
4	1.250	1.470	<i>reject</i>
5	.965	1.385	<i>reject</i>

Factor loadings of $\pm .30$ to $\pm .40$ are considered as the minimum acceptable (Hair et al., 2006: 129). However, for the sample size in this study higher factor loadings must be considered. Hair et al. (2006: 128) states that only factor loadings of .50 and above are significant for a sample of 120 at a significance level of $p < .05$. This decreases to .45 as the sample size increases to 150. A limit of .48 is adopted in this analysis. The component matrix with three factors extracted and VARIMAX-rotation to assist in interpretation is shown in table 3.3. As can be seen, of the twenty two relevant items all except one loaded onto their corresponding factors (factor 1 = emotional exhaustion, factor 2 = reduced personal accomplishment and factor 3 = depersonalization) with significant loadings. The loading of the 5th depersonalization item (DEP 5) onto factor 3 was below the significance level at .43, but as it had its highest loading on factor 3, it was decided to retain it in the depersonalization measure. As previously mentioned, in the studies of Bryne (1993) and Schaufeli and van Dierendonck (1993), two items (Q12 and Q16 corresponding to rPA 4 and EE 8, respectively in this study) were found to be problematic. In this analysis item EE 8 was not found to be problematic. Similar to the results of Bryne (1993) and Schaufeli and van Dierendonck (1993), the item rPA 4 was found to have a high cross-loading between factors 1 and 2 (.46 and .59, respectively). As the loading on factor 1 was below the significance level (.48, see above) and the loading on factor 2 was above the significance level, it was decided to keep the item in the measure for reduced personal accomplishment. VARIMAX-rotation is orthogonal, which means that the factors remain uncorrelated throughout the rotation process. Where factors may be correlated and conceptually linked Hair et al. (2006: 153) recommends applying a nonorthogonal rotation method such as Oblique rotation and assessing comparability to the orthogonal results. A further analysis was conducted using an Oblimin rotation. In oblique rotation the loading matrix becomes the pattern matrix (Tabachnick & Fidell, 2007: 625) and is used for interpretation purposes (Hair et al., 2006: 153). The results are shown in table A-3.1 (see appendix 3). The correlation between the three factors was found to be .84 between factors 1 and 2, .22 between factors 1 and 3, and .25 between factors 2 and 3. As expected, the pattern matrix had

comparable loadings with the interpretation being the same as found through the VARIMAX-rotation, and the three factor structure with the relevant corresponding items was confirmed.

TABLE 3.3 VARIMAX-Rotated Component Analysis Matrix for MBI

	<i>Factor</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
EE 1	.74		
EE 2	.69		
EE 3	.82		
EE 4	.54		
EE 5	.75		
EE 6	.63		
EE 7	.74		
EE 8	.66		
EE 9	.76		
rPA 1		.60	
rPA 2		.80	
rPA 3		.80	
rPA 4	.46	.59	
rPA 5		.77	
rPA 6		.75	
rPA 7		.77	
rPA 8		.68	
DEP 1			.55
DEP 2			.82
DEP 3			.80
DEP 4			.75
DEP 5			.43
Percentage of Variance Explained	27.5%	18.5%	9.4%

Note: Bold type indicates significant loadings.
Only Factor loadings above ± 0.4 are shown.

Unidimensional Scale of Burnout

Although Maslach and Jackson have stated that “a high degree of burnout is reflected in high scores on the emotional exhaustion and depersonalization subscales and in low scores on the personal accomplishment subscale” (Maslach & Jackson 1986: 2; cited in Leiter 1993: 238), they have not provided instructions for the calculation of a

unidimensional score. In the MBI test manual (Maslach, Jackson & Leiter, 1996), the instruction is given that the three different dimensions of burnout should not be combined into a single score (Schaufeli & Taris, 2005). However, some authors have argued that burnout can be considered as a unitary concept (see, for example, Golembiewski & Munzenrider, 1981; Meier, 1984). Leiter (1993) suggests that a unidimensional burnout measure would be convenient even if there was a cost of conceptual accuracy. In an examination of the construct validity of the MBI-GS Taris, et al. (1999) found that a unidimensional conceptualization fitted the data as well as a two- or three-factor structure and suggested that: “from a practical point of view it is perfectly possible to consider burnout as a *unidimensional* concept. This implies that a quick impression of the degree to which a person suffers from burnout can be obtained from inspection of the overall burnout score, rather than to consider and interpret the scores on three separate dimensions” (Taris et al., 1999: 234). Brenninkmeijer and van Yperen (2003) observe that a unidimensional approach is not uncommon in research on related multidimensional concepts in psychology and comment that “there are theoretical and practical reasons to consider burnout as a single construct” (Brenninkmeijer & van Yperen, 2003: 17).

To confirm the internal validity and reliability of the unidimensional measure of burnout, the scores for personal accomplishment were reversed to form the independent variable reduced personal accomplishment and then the Cronbach’s alpha for the twenty two items was calculated. It was found to be $\alpha = .86$, which is greater than the cut off value of .7 (Hair et al., 2006), indicating a high level of consistency and validity of the MBI scale. The Cronbach’s alpha value if each scale item was deleted was also investigated. The results are shown in table 3.4. As can be seen, deletion of any of the items would not have changed the value of Cronbach’s alpha for the MBI measure.

3.2.2 Occupational Self-Efficacy

In line with Fisher’s (1980) recommendation that occupational measures should be used to increase predictive validity when considering relationships between personality measures and performance outcomes, the respondents’ self-efficacy in the work place was measured through the use of the 19-item Occupational Self-Efficacy Scale (OCCSEFF) (Schyns & von Collani, 2002). The correlation between this scale and a general self-efficacy scale (Sherer, 1982; cited in Schyns & von Collani, 2002) was found to be .57. The scale was also found to correlate with Speier and Frese’s (1997) work-related scale at a value of .67 (Schyns & von Collani, 2002). Responses were gathered on a 1 to 5 Likert-type scale. For each item, response 1 represented the highest level of self-efficacy, while response 5 represented the lowest level of self-efficacy. For instance, a sample item is “I am confident that I could deal efficiently with unexpected events in my job”. Responses for the sample items were: 1. Completely true; 2. True; 3. Sometimes true; 4. Untrue; 5. Completely untrue. Prior to conducting the data analysis, responses were reverse-scored so that a higher score equated to a higher level of

Occupational Self-Efficacy. The internal consistency (Cronbach's alpha) was $\alpha = .89$. The mean for this study was 74.3 with a standard deviation of 7.53.

TABLE 3.4 Cronbach's Alpha for MBI

Item	Cronbach's Alpha if Item Deleted
EE 1	.859
EE 2	.862
EE 3	.849
EE 4	.852
EE 5	.849
EE 6	.852
EE 7	.852
EE 8	.852
EE 9	.854
rPA 1	.861
rPA 2	.853
rPA 3	.851
rPA 4	.848
rPA 5	.851
rPA 6	.848
rPA 7	.851
rPA 8	.860
DEP 1	.859
DEP 2	.858
DEP 3	.855
DEP 4	.859
DEP 5	.858

Note: Cronbach's alpha for all 22 items = .860

Dimensionality of Occupational Self-Efficacy

As this scale has only recently been developed (Schyns & von Collani, 2002) a confirmatory factor analysis was conducted on the 19 items that make up the scale to confirm that the scale is unidimensional. The value for the Bartlett's Test of Sphericity was found to be significant ($p < .001$) and the Kaiser's measure of sampling adequacy was found to be .88 indicating that factor analysis is appropriate. Five factors recorded Eigenvalues above one (7.092, 1.391, 1.373, 1.121, and 1.001) and explained a total of 63.04 % of the variance. A scree test was conducted and the plot is shown in figure 3.2.

The scree plot begins to level out sharply after the first component indicating that only one factor should be retained.

FIGURE 3.2 Scree Plot for OCCSEFF

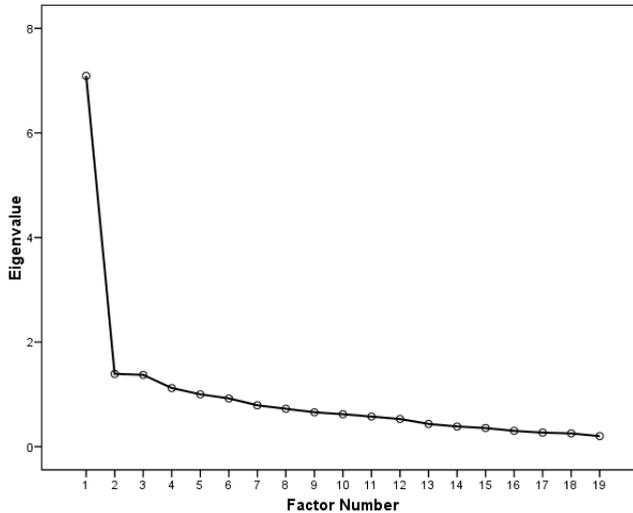


TABLE 3.5 Comparison of Eigenvalues from Factor Analysis and Corresponding Values from Parallel Analysis for OCCSEFF

Component Number	Actual Eigenvalues from PCA	Criterion value from parallel analysis	Decision
1	7.092	1.760	retain
2	1.391	1.600	<i>reject</i>
3	1.373	1.491	<i>reject</i>
4	1.121	1.396	<i>reject</i>
5	1.001	1.305	<i>reject</i>
6	.923	1.227	<i>reject</i>

As recommended by Pallant (2006: 184) a parallel analysis was again conducted. The output is compared to the Eigenvalues from the factor analysis in table 3.5. Again, it is indicated that only one component should be retained. The component matrix with one factor extracted is shown in table 3.6. It can be seen that all of the items loaded onto the factor with positive loadings. Fifteen of the items had significant loadings. These results confirm that OCCSEFF can be considered as unidimensional.

TABLE 3.6 Component Matrix for the OCCSEFF Scale

	<i>Factor</i>
	<i>1</i>
OCCSEFF 1	.61
OCCSEFF 3 (R)	.60
OCCSEFF 4 (R)	.51
OCCSEFF 5 (R)	.40
OCCSEFF 6	.37
OCCSEFF 7 (R)	.67
OCCSEFF 8	.20
OCCSEFF 9 (R)	.58
OCCSEFF 10 (R)	.40
OCCSEFF 11	.63
OCCSEFF 12	.74
OCCSEFF 13	.67
OCCSEFF 14	.70
OCCSEFF 15	.67
OCCSEFF 16	.76
OCCSEFF 17	.77
OCCSEFF 18	.60
OCCSEFF 19	.66
OCCSEFF 20	.72

Note: Bold type indicates significant loadings.

Item 2 has been removed as recommended by Schyns and von Collani (2002).

Percentage of variance explained = 37.3%

3.2.3 Leader-Member Exchange (LMX)

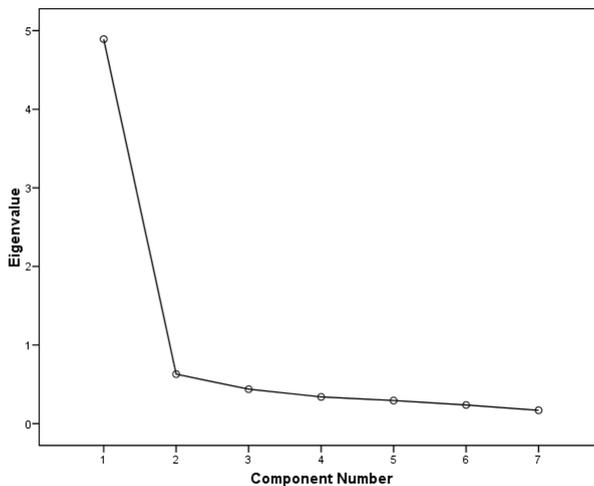
To assess the respondents' perception of the quality of their LMX with their manager, the seven-item LMX-7 (Graen & Uhl-Bien, 1995) was used. This scale is the most widely used scale for measuring the quality of the LMX relationship (Boies & Howell, 2006). In their meta-analytic review of LMX theory, Gerstner and Day (1997) found that LMX-7 appeared to provide the soundest psychometric properties and recommended it as the best measure to use for the assessment of the overall exchange quality. Their results also suggested that LMX is more reliably assessed from the member's perspective than the leader's perspective. Responses were gathered on a 1 to 5 Likert-type scale. For each item, response 1 represented the lowest level of LMX, while response 5 represented the highest level. For instance, a sample item is "Do you

know where you stand with your manager...do you usually know how satisfied your manager is with you?" Responses for the sample item were: 1. Rarely; 2. Occasionally; 3. Sometimes; 4. Fairly often; 5. Very often. The internal consistency (Cronbach's alpha) was $\alpha = .93$. The mean for this study was 25.3 with a standard deviation of 6.73.

Dimensionality of LMX

Although Graen and Uhl-Bien (1995) argue that "LMX has multiple dimensions, but these dimensions are so highly correlated they can be tapped into with the single measure of LMX" (Graen & Uhl-Bien, 1995: 237), other authors have suggested that LMX may be made up of four dimensions (Liden & Maslyn, 1998) or even six dimensions may be present (Schriesheim et al., 1999). To confirm the factor structure of the LMX measure used in this study a confirmatory factor analysis was conducted on the 7 items that make up the scale. The value for the Bartlett's Test of Sphericity was found to be significant ($p < .001$) and the Kaiser's measure of sampling adequacy was found to be .92 indicating that factor analysis is appropriate. Only one factor recorded an Eigenvalue above one (4.892). This factor explained 69.9 % of the variance. A scree test was conducted and the plot is shown in figure 3.3.

FIGURE 3.3 Scree Plot for LMX



The scree plot begins to level out sharply after the first component, again indicating that only one factor should be retained. The component matrix is shown in table 3.7. As can be seen all seven of the items loaded onto the factor with positive and significant loadings. These results confirm that LMX can be considered as unidimensional.

TABLE 3.7 Component Matrix for the LMX Scale

	<i>Factor</i> <i>1</i>
LMX 1	.86
LMX 2	.88
LMX 3	.90
LMX 4	.77
LMX 5	.73
LMX 6	.84
LMX 7	.86

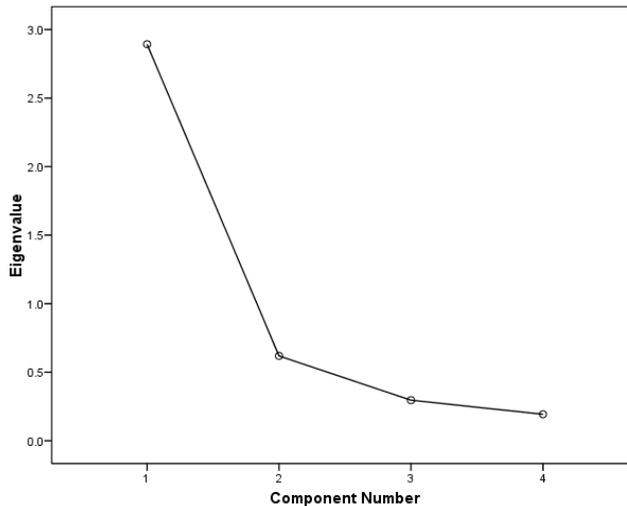
Note: Bold type indicates significant loadings.
Percentage of variance explained = 69.9%

3.2.4 Communication Frequency

To measure the frequency of the communication between the employee and the manager, McAllister’s (1995) four-item scale was used. Responses were gathered on a 1 to 5 Likert-type scale. For each item, response 1 represented the lowest level of communication, while response 5 represented the highest level. For instance, a sample item is “*Do you interact with your manager at work?*” Responses for the sample items were: 1. Once or twice in the last 6 months; 2. Once or twice every month; 3. Once or twice every week; 4. Once or twice daily; 5. Many times daily. The internal consistency (Cronbach’s alpha) was $\alpha = .87$. The mean for this study was 9.95 with a standard deviation of 3.59.

Dimensionality of Communication Frequency

As this scale has not been extensively used a confirmatory factor analysis was conducted on the 4 items that make up the scale to confirm that the scale can be considered as unidimensional. The value for the Bartlett’s Test of Sphericity was found to be significant ($p < .001$) and the Kaiser’s measure of sampling adequacy was found to be .78, indicating that factor analysis is appropriate. One factor recorded an Eigenvalue above one (2.893) and explained 72.3 % of the variance. A scree test was conducted and the plot is shown in figure 3.4. The scree plot begins to level out sharply after the first component, again indicating that only one factor should be retained. The component matrix is shown in table 3.8. As can be seen all four of the items loaded onto the factor with positive and significant loadings. These results confirm that CF can be considered as unidimensional.

FIGURE 3.4 Scree Plot for CF**TABLE 3.8** Component Matrix for the CF Scale

	<i>Factor</i>
	<i>1</i>
CF 1	.87
CF 2	.91
CF 3	.89
CF 4	.72

Note: **Bold type** indicates significant loadings.
Percentage of variance explained = 72.3%

3.2.5 Conscientiousness and Neuroticism

In their assessment of measures of the Big-Five, John and Srivastava (1999) recommend using the Big Five Inventory (BFI) (John, Donahue & Kentle, 1991; cited in John & Srivastava, 1999: 122) as an efficient measure of the core attributes of the Big-Five. Whilst identifying that the NEO questionnaires of Costa and McCrae (1992) are the best validated and that Goldberg's (1992) trait descriptive adjectives (TDA) is the most commonly used measure consisting of adjectives, they found in a comparison of these measures that for conscientiousness, the scales were virtually equivalent, whilst for neuroticism the BFI and TDA were almost equivalent with substantial convergence evident for the BFI and NEO-FFI. They observed that a significant advantage of the BFI is that it consists of a small number of items (44), short phrases and an accessible

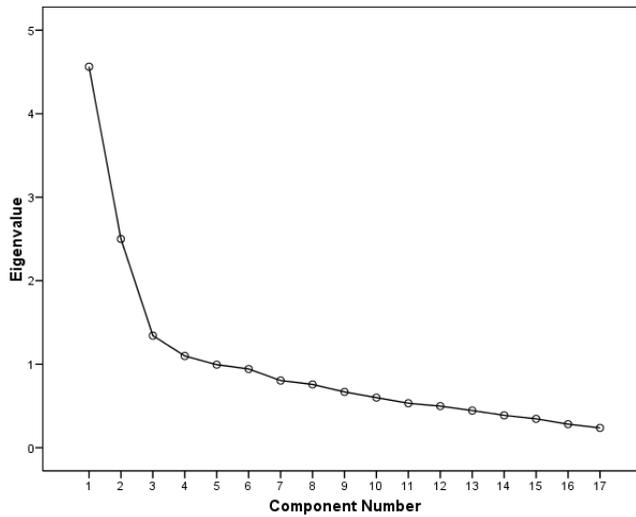
vocabulary, which makes it efficient in that it takes only about 5 minutes to complete, compared to 15 minutes for the TDA and the NEO-FFI. They state that there is no loss of psychometric properties or content coverage with the BFI despite it being a short instrument. Alpha reliabilities for the BFI scales were typically in a range of .75 to .90 and there was high three month test-retest reliability with a mean of .85 (John & Srivastava, 1999).

Conscientiousness was measured with the relevant nine-item scale and neuroticism with the eight-item scale. Responses were gathered on a 1 to 5 Likert-type scale with the respondent asked a set of sentences describing how they see themselves. For instance, a sample item for conscientiousness is *"Makes plans and follows them through"* and for neuroticism a (reversed) item is *"Remains calm in tense situations"*. Responses were 1. Strongly disagree; 2. Disagree; 3. Neither disagree or agree; 4. Agree; 5. Strongly agree. Once reverse scored items were corrected, a high score indicated a high level in the personality trait. The internal consistency (Cronbach's alpha) was $\alpha = .76$ for conscientiousness and $\alpha = .81$ for neuroticism. The mean values in this study were 18.8 and 37.4 for neuroticism and conscientiousness, respectively, with standard deviations of 6.13 and 5.21, respectively.

Dimensionality of Conscientiousness and Neuroticism

To confirm the factor structure for conscientiousness and neuroticism, a confirmatory factor analysis was conducted on the 17 items that make up these scales, to check that each measure loaded cleanly on to its respective factor. The value for the Bartlett's Test of Sphericity was found to be significant ($p < .001$) and the Kaiser's measure of sampling adequacy was found to be .77 indicating that factor analysis is appropriate. Four factors recorded Eigenvalues above one (4.563, 2.500, 1.342 and 1.099) and explained a total of 55.9% of the variance. A scree test was conducted and the plot is shown in figure 3.5. The scree plot begins to level out sharply after the second component indicating that only two factor should be retained. As recommended by Pallant (2006: 184) a parallel analysis was conducted. The output is compared to the Eigenvalues from the factor analysis in table 3.9. Again, it is indicated that two components should be retained.

The component matrix with two factors extracted is shown in table 3.10. As can be seen, all 17 items loaded onto their corresponding factors (factor 1 = neuroticism, factor 2 = conscientiousness). All of the loadings were significant except for three of the conscientiousness items. As they had loaded onto their respective factor and did not have large cross-loadings onto the other factor it was decided to retain them in the analysis.

FIGURE 3.5 Scree Plot for CONSC and NEURO**TABLE 3.9** Comparison of Eigenvalues from Factor Analysis and Corresponding Values from the Parallel Analysis for CONSC and NEURO

Component Number	Actual Eigenvalues from PCA	Criterion value from parallel analysis	Decision
1	4.563	1.7011	retain
2	2.500	1.5491	retain
3	1.342	1.4288	<i>reject</i>
4	1.099	1.3288	<i>reject</i>
5	.994	1.2497	<i>reject</i>
6	.942	1.1750	<i>reject</i>

TABLE 3.10 OBLIMIN - Rotated Pattern Analysis Matrix for CONSC and NEURO

	<i>Factor</i>	
	<i>1</i>	<i>2</i>
CONSC 1		.69
CONSC 2		.43
CONSC 3		.61
CONSC 4		.47
CONSC 5		.57
CONSC 6		.42
CONSC 7		.64
CONSC 8		.68
CONSC 9		.54
NEURO 1	.70	
NEURO 2	.57	
NEURO 3	.68	
NEURO 4	.67	
NEURO 5	.67	
NEURO 6	.54	
NEURO 7	.74	
NEURO 8	.64	
Percentage of Variance Explained	26.8%	14.7%

Note: Bold type indicates significant loadings.
 Only Factor loadings above ± 0.4 are shown.

3.2.6 Work Locus of Control

Phares (1976) and Daniels and Guppy (1992) recommend that locus of control is treated as a domain-specific construct. The respondents' work locus of control was measured using Spector's (1988) 16-item Work Locus of Control Scale (WLCS). This scale measures the generalized control belief in the work place. Blau (1993) posited that this scale had a better conceptual fit to work-related outcomes than more general scales such as Rotter's (1966) scale. In two studies the correlation between Rotter's (1966) scale and Spector's (1988) scale was found to be .54 (Spector, 1988) and .50 (Blau, 1993).

The WLCS has been found to have a high level of internal reliability (Furnham & Drakeley, 1993). Further, in their meta-analysis Ng et al. (2006) found that the scale had been used in 43 studies and had an average reliability of 0.78. The scale has also been found to have a high level of internal consistency across a wide range of nationalities,

(Spector et al., 2001). Response choices were gathered on a 1 to 5 Likert-type scale. Half the items were stated in the internal and half in the external direction. For instance, an external sample item is “*When it comes to landing a really good job, who you know is more important than what you know.*” The internal consistency (Cronbach’s alpha) for the WLCS was found to be $\alpha = .84$. The mean for this study was 36.1 with a standard deviation of 7.20. This compares to a mean value of WLCS of 42.5 in a sample of 221 employees in a university and to value of 39.8 in a sample of 399 accountants with standard deviations of 9.34 and 9.47, respectively (Daniels & Guppy, 1992). The individuals in this study have a higher level of internality of work locus of control than either population in the Daniels and Guppy (1992) study. Prior to conducting the data analysis, responses were reverse-scored so that a higher value equated to a high level of internal WLCS.

Dimensionality of the WLCS

An issue for many years has been whether locus of control is unidimensional or multidimensional (Furnham & Steele, 1993). For example, Lange and Tiggemann (1981) examined the dimensionality and reliability of Rotter’s (1966) locus of control scale. Two distinct independent factors were found relating to *personal* and *political* control beliefs. Some authors have questioned whether the WLCS should be considered as a unitary scale or as two factors (Daniels & Guppy, 1992; Furnham & Steele, 1993; O’Conner & Morrison, 2001; Oliver, Jose & Brough, 2006). Whilst recognizing that WLCS can be used as an overall measure of generalized perceived work control, Daniels and Guppy (1992) suggest that the two-dimensional structure of *external agents* control and *personal* control should also be considered. Results of the study by O’Conner and Morrison (2001) supported the view that LOC is a multidimensional construct, and that there is a need to consider both the internal and external subscales of the WLCS. Research by Oliver et al. (2006) found the two-factor model to be superior to the one-factor model, and recommended that the two-factor model be used to prevent a loss of specificity and precision.

Factor Analysis of WLCS

To check the factor structure of the WLCS construct a factor analysis was conducted on the 16 items that make up the scale. The value for the Bartlett’s Test of Sphericity was found to be significant ($p < .001$), which indicates that factor analysis is appropriate. The Kaiser’s measure of sampling adequacy was found to be .80, which is described as “meritorious” for factor analysis (Hair et al., 2006: 114). Five factors were extracted recording Eigenvalues above one (4.888, 2.124, 1.276, 1.087 and 1.002), and explained a total of 64.85 % of the variance. A scree test was conducted and the plot is shown in figure 3.6. The scree plot begins to level out after the second component indicating that two factors should be retained. A parallel analysis was conducted and the

output is compared to the values from the factor analysis in table 3.11. As in the scree plot, it is indicated that two factors should be retained.

FIGURE 3.6 Scree Plot for the WLCS

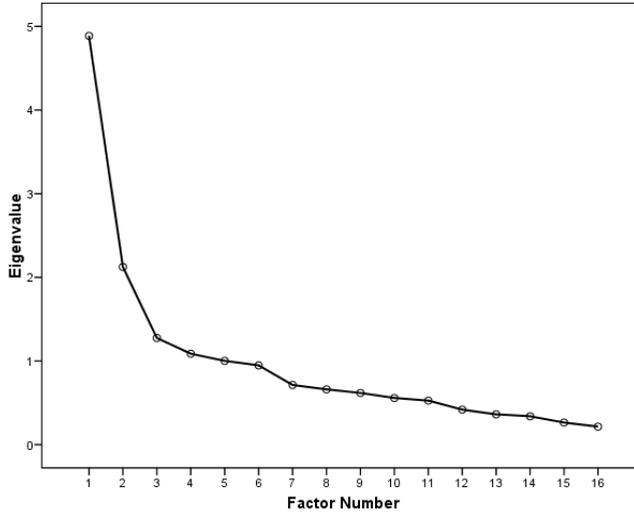


TABLE 3.11 Comparison of Eigenvalues from Factor Analysis and Corresponding Values from Parallel Analysis for WLCS

Component Number	Actual Eigenvalues from PCA	Criterion value from parallel analysis	Decision
1	4.888	1.652	retain
2	2.124	1.513	retain
3	1.276	1.395	<i>reject</i>
4	1.087	1.299	<i>reject</i>
5	1.002	1.215	<i>reject</i>
6	.948	1.139	<i>reject</i>

The component matrix with two factors extracted and VARIMAX-rotation to assist in interpretation is shown in table 3.12. Eight of the items loaded onto factor one with significant loadings and four onto factor two. VARIMAX-rotation is orthogonal, which means that the factors remain uncorrelated throughout the rotation process. Where factors may be correlated and conceptually linked Hair et al. (2006: 153) recommends applying a nonorthogonal rotation method such as Oblique rotation and assessing comparability to the orthogonal results.

TABLE 3.12 VARIMAX-Rotated Component Analysis Matrix for the WLCS

		<i>Factor</i>	
		<i>1</i>	<i>2</i>
WLCS1 (R)	A job is what you make of it.	.05	.77
WLCS2 (R)	On most jobs people can pretty much accomplish whatever they set out to accomplish.	.15	.75
WLCS3 (R)	If you know what you want out of a job, you can find a job that gives it to you	.11	.64
WLCS4 (R)	If employees are unhappy with a decision made by their boss, they should do something about it	.13	.42
WLCS5	Getting the job you want is mostly a matter of luck	.60	.14
WLCS6	Making money is primarily a matter of good fortune	.56	-.19
WLCS7 (R)	Most people are capable of doing their jobs well if they make the effort	-.03	.70
WLCS8	In order to get a really good job you need to have family members or friends in high places	.64	.23
WLCS9	Promotions are usually a matter of good fortune	.78	.11
WLC10	When it comes to landing a really good job, who you know is more important than what you know	.76	.19
WLCS11 (R)	Promotions are given to employees who perform well on the job	.41	.35
WLCS12	To make a lot of money you have to know the right people	.79	.07
WLCS13	It takes a lot of luck to be an outstanding employee on most jobs	.66	.01
WLCS14 (R)	People who perform their jobs well generally get rewarded for it	.46	.35
WLCS15 (R)	Most employees have more influence on their supervisors than they think they do	.30	.19
WLCS16	The main difference between people who make a lot of money and people who make a little money is luck	.69	.14
Percentage of Variance Explained		30.5%	13.3%

Note: Bold type indicates significant loadings.

A further analysis was conducted using an Oblimin rotation. In oblique rotation the loading matrix becomes the pattern matrix (Tabachnick & Fidell, 2007: 625) and is used for interpretation purposes (Hair et al., 2006: 153). The correlation between the two factors was found to be .27 and, as expected, the pattern and structure matrices had

comparable loadings with the interpretation being the same as found through the VARIMAX-rotation.

In their analysis Daniel and Guppy (1992) found evidence of a two-factor solution with a first factor relating to luck and powerful others having influence over the work context and a second factor relating to the respondent having personal influence over the work context. The first factor was labelled “*external agents control*” and the second factor “*personal control*” (1992: 325). In this thesis’ analysis two factors are indicated which fit well with the descriptors provided by Daniel and Guppy (1992). However, unlike their results where all of the reverse scored items formed the second factor in this study only four of the eight reverse scored items loaded onto the second factor with significant loadings with a value greater than 0.48. The factor analysis was redone with only the items with significant loadings included (1R, 2R, 3R, 7R; 5, 6, 8, 9, 10, 12, 13, 16). As in the previous factor analysis the parallel analysis indicated that two factors should be extracted.

The results of the VARIMAX-rotated component analysis is shown in table 3.13. The eight items for the *external agents control* factor and the four items for the *personal control* factor were found to load cleanly and significantly onto each of the two factors as expected.

Due to the sample size in this study it was not feasible to do a confirmatory factor analysis using structural equation modelling. Instead, as recommended by Hair et al. (2006: 153), validity was tested through split sample analysis. The sample was split into two equal samples, each of 64 respondents, and the factor model reestimated. Table 3.14 shows the Split-Sample Estimation for the two-factor model for the twelve-item WLCS. As can be seen the two Oblimin-Rotations are comparable in terms of each of their loadings, indicating that the results are relatively stable within the sample in this study. To check internal reliability and validity of the factors Cronbach’s alpha scores were calculated. For the *external agents control* subscale with eight items $\alpha = .85$ and for the *personal control* subscale of four items $\alpha = .73$. The WLCS (18 item scale) is used in this study as an overall measure of generalized perceived work control. Following the recommendations of Daniels and Guppy (1992), O’Conner and Morrison (2001) and Oliver et al. (2006) the two-factor structure with both the internal (4 item) and external (8 item) subscales, (*external agents control* and *personal control*), will be used for further investigations.

TABLE 3.13 VARIMAX-Rotated Component Analysis Matrix for the Twelve-Item WLCS

		<i>Factor</i>	
		<i>1</i>	<i>2</i>
WLCS12	To make a lot of money you have to know the right people	.80	
WLCS9	Promotions are usually a matter of good fortune	.79	
WLC10	When it comes to landing a really good job, who you know is more important than what you know	.76	
WLCS16	The main difference between people who make a lot of money and people who make a little money is luck	.70	
WLCS13	It takes a lot of luck to be an outstanding employee on most jobs	.67	
WLCS8	In order to get a really good job you need to have family members or friends in high places	.65	
WLCS5	Getting the job you want is mostly a matter of luck	.60	
WLCS6	Making money is primarily a matter of good fortune	.57	
WLCS1 (R)	A job is what you make of it.		.82
WLCS2 (R)	On most jobs people can pretty much accomplish whatever they set out to accomplish.		.77
WLCS7 (R)	Most people are capable of doing their jobs well if they make the effort		.69
WLCS3 (R)	If you know what you want out of a job, you can find a job that gives it to you		.65
Percentage of Variance Explained		35.5%	17.0%

Note: Only Factor loadings above ± 0.4 are shown.

TABLE 3.14 Validation of Component Factor Analysis by Split-Sample Estimation with Oblimin-Rotation

	Split sample 1		Split sample 2	
	Pattern Matrix Factor Loadings			
	<i>1</i>	<i>2</i>	<i>1</i>	<i>2</i>
WLCS 9	.84		.76	
WLCS 12	.81		.80	
WLCS 16	.76		.57	
WLCS 10	.65		.85	
WLCS 6	.65		.50	
WLCS 13	.64		.76	
WLCS 8	.56		.72	
WLCS 5	.57		.63	
WLCS 1 (R)		.79		.84
WLCS 2 (R)		.75		.74
WLCS 7 (R)		.74		.62
WLCS 3 (R)		.44		.82

Note: Only Factor loadings above ± 0.4 are shown.

3.2.7 Job Demand (JD)

Significant pressure is exerted by the government on underperforming local authorities. Due to the recognition of the centrality of the role of the local coordinators to the achievement of the strategy and targets, it was considered that the level of target achievement could act as a proxy for the level of demand, strain or pressure that was experienced by individual local coordinators. The Office of National Statistics (ONS) releases quarterly under-18 conception rates for each local authority 14 months after the period to which they relate. This is due to the information on conceptions not being recorded until after the abortion or birth occurs, a delay of six weeks to allow for the legal limit on birth registration and three months for compilation of the statistics. ONS releases annual conception data in February each year. Quarterly data are released in May, August and November (Department for Children, Schools and Families, 2005). At the time of the survey (November 2006) the latest statistics available were for Q2 2005 (released in August 2006). An average of the results for Q1 and Q2 was taken and used to calculate the percentage achievement of the targeted reduction of 50% since 1999 for each local area. The level of target achievement in each local authority area was used as a proxy for the level of job demand or pressure on each of the corresponding individual

local coordinators. The mean value for the attainment of the government target was 120.1% above target and the standard deviation was 14.5%.

3.2.8 Control Variables

Gender and tenure have both been identified as individual variables that affect the quality of LMX relationships (Bauer & Green, 1996; Bauer et al., 2006; Duchon, Green, & Taber, 1986). Previous research has indicated that the quality of the relationship between the manager and an employee is established within the first two months (Bauer & Green, 1996). The respondents' gender and whether they had worked with their current line manager for more than three months were collected. Gender was coded as 0 for female and 1 for male. Tenure was coded as 0 for more than three months and 1 for less than three months.

3.3 HIERARCHICAL REGRESSION ANALYSIS

Hierarchical multiple regression provides a means of objectively assessing the nature of the relationship between the independent and dependent variables; it allows determination of the relative importance of each independent variable in the prediction of a dependent variable, and it provides insight into the relationships amongst independent variables in their prediction of the dependent variable (Hair et al., 2006: 190). For these reasons it is adopted for the analyses conducted in this study. In each analysis, independent variables are added into the equation in steps in an order designed to investigate the specific research questions. In the interpretation of the analyses, both the full correlation and the unique contribution of the independent variables are considered.

3.3.1 Comparison of Relative Effects of Independent Variables

Multiple regression provides not only the variable regression coefficients, but also coefficients of the standardized data, termed beta coefficients (β). The advantage of beta coefficients is that they reflect the relative impact on the dependent variable of a change of one standard deviation of the independent variables (Hair et al., 2006: 226). This allows the relative importance of different independent variables in an equation to be assessed.

3.3.2 Testing for Curvilinear Effects

Although several types of data transformation can be used for linearizing and testing for a curvilinear relationship, this direct approach is limited in that it does not provide for a statistical means of assessing whether the curvilinear or linear model is most appropriate. A further limitation is that it can only accommodate univariate relationships and not interactions between variables (Hair et al., 2006: 200). In a simple regression model, a curvilinear relationship can be modelled with the equation:

$$\hat{Y} = B_0 + B_1 X + B_2 X^2 \quad (\text{Equation 3.1})$$

where, \hat{Y} = predicted score in the unstandardized regression equation
 B_0 = intercept
 $B_1 X$ = linear effect of X
 $B_2 X^2$ = curvilinear effect of X

As each new variable is entered into the regression model a statistical test of the nonlinear components can be made. Hair et al. (2006: 200) caution that multicollinearity can create issues in the assessment of the statistical significance of the individual coefficients and recommend that the significance of the polynomial term is assessed through evaluation of whether the change in the R^2 is significant, and not through the significance of the individual coefficient. To determine the nature of curvilinear relationships Hair et al. (2006: 201) recommend that the analysis starts with the linear term after which the higher-order polynomial terms are added until nonsignificance is achieved. They suggest that quadratic and cubic polynomials are usually sufficient to model most curvilinear relationships (Hair et al., 2006: 203).

3.3.3 Testing for Interactions or Moderation Effects

When a variable changes the form of the relationship between another independent and the dependent variable it is termed a moderator effect. The moderation relationship can be modelled with the equation:

$$\hat{Y} = B_0 + B_1 X + B_2 Z + B_3 X Z \quad (\text{Equation 3.2})$$

where, \hat{Y} = predicted score in the unstandardized regression equation
 B_0 = intercept
 $B_1 X$ = linear effect of X
 $B_2 Z$ = linear effect of Z
 $B_3 X Z$ = moderator effect of Z on X

Once again, Hair et al. (2006: 203) recommend that the significance of the interaction term is assessed through evaluation of whether the change in the R^2 is significant, and not through the significance of the individual coefficient. Cohen et al. (2003: 211) state that when considering whether to include higher-order terms there are no hard rules. To decide between two equations of adjacent order, one of the following criteria may be employed:

1. the loss (or gain) in prediction attributed to the highest-order term employing some conventional level of significance.
2. the change in R^2 . The change in R^2 from $R^2_{Y.A}$ to $R^2_{Y.B}$ is the squared semipartial correlation of B with the dependent variable over and above A . This is calculated from the equation:

$$R_{YB.A}^2 = \frac{R_{Y.AB}^2 - R_{Y.A}^2}{1 - R_{Y.A}^2} \quad (\text{Equation 3.3})$$

Squared partial correlations of .02, .13, and .26 are reflective of small, moderate, and large effect sizes, respectively; and

3. the change in the *adjusted R*². Whilst the addition of any independent variable to an equation will result in an increase of *R*², the *adjusted R*² (the estimated proportion of variance in *Y* accounted for in the population by a polynomial of that order) may increase or decrease. A reasonable criterion for deciding between two equations is when the *adjusted R*² change is between .02 and .05.

In each analysis the steps involved in the hierarchical regression analyses are specified and discussed.

3.3.4 Tests for Mediation

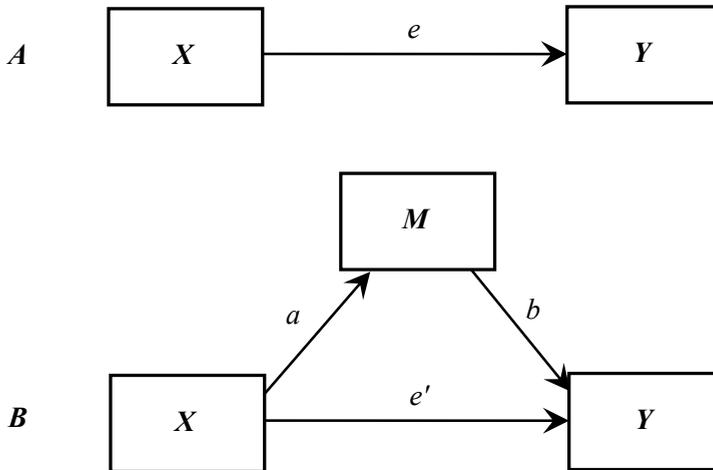
The most frequently used method of testing for mediation is the procedure outlined by Baron and Kenny (1986) (MacKinnon, Lockwood, Hoffman, West & Sheets, 2002). According to Baron and Kenny (1986) a variable is defined as a mediator if (see figure 3.7):

1. there is a significant relationship between the independent variable (*X*) and the dependent variable (*Y*);
2. there is a significant relationship between the independent variable (*X*) and the mediator (*M*);
3. the mediator (*M*) still predicts the dependent variable (*Y*) after controlling for the independent variable (*X*); and
4. the relationship between the independent variable (*X*) and the dependent variable (*Y*) is “less” (Baron & Kenny, 1986: 1177) when the mediator (*M*) is entered into the equation.

Two assumptions that are made are that there is no measurement error in the mediator and that the dependent variable does not cause the mediator. They recognize that because the mediator is often an internal, psychological variable it is likely to suffer from measurement error.

Mediation is said to be full when the relationship (*e'*) between the independent variable (*X*) and the dependent variable (*Y*) is reduced to zero when the mediator (*M*) is added (Baron & Kenny, 1986; Hair et al., 2006: 844). For partial mediation, Baron and Kenny (1986) do not provide a measure of how much “less” is, in the fourth condition, but do mention the Sobel test as being able to provide a significance test for the indirect effect of (*X*) on (*Y*) via (*M*). Preacher and Hayes (2004) note that this test is rarely used in practice and suggest that this may be due to the test not being stated as a formal requirement by Baron and Kenny (1986) and because although the Baron and Kenny (1986) criteria are easily conducted by popular statistical packages, the packages do not provide the ability to automatically conduct a Sobel test.

FIGURE 3.7 Direct and Mediated Relationships



where, X is the dependent variable.

M is the mediator.

Y is the dependent variable.

a is the unstandardized regression coefficient for the relationship X and M .

b is the unstandardized regression coefficient for the relationship M and Y (when X is controlled for).

e is the total effect of X on Y .

e' is the direct effect of X on Y after controlling for M .

Preacher and Hayes (2004) argue for a formal test of mediation that addresses the testing of the significance of the indirect effect (ab equivalent to $e - e'$) and recommend use of the Sobel test. They argue the Sobel test “more directly addresses the mediation hypothesis than does the series of regression analyses recommended by Baron and Kenny (1986)” (Preacher & Hayes, 2004: 719). In an assessment of 14 methods of assessing mediation effects, the Sobel test was found to be superior to other methods for assessing mediation effects (MacKinnon et al., 2002).

With reference to figure 3.7 above, the test assesses the significance of the difference between the total effect e of X on Y and the direct effect e' when M is controlled for. The formula for the Sobel test for the mediation relationship shown in figure 3.7 is (Preacher & Hayes, 2004: 718):

$$Z_{\text{value}} = \frac{a \times b}{\sqrt{b^2 \times s_a^2 + a^2 \times s_b^2}} \quad (\text{Equation 3.4})$$

where, a is the unstandardized regression coefficient for the relationship X and M .
 b is the unstandardized regression coefficient for the relationship M and Y
 (when X is controlled for).
 S_a is the standard error of a .
 S_b is the standard error of b .

The significance of the two-tailed p value for the Sobel test is based on the assumption that $a \times b$ is normally distributed under the null hypothesis. Preacher and Hayes (2004) state that often the distribution is nonnormal and positively skewed resulting in an underpowered test of mediation. As a solution they suggest an approach using *bootstrapping* (Preacher & Hayes, 2004). They explain that bootstrapping is a nonparametric method which is computationally intensive as it involves repeated sampling of the data set and estimating the indirect effect each time. An empirical approximation of the sampling distribution of ab is constructed through repetition of the process and this is used to calculate confidence intervals for the indirect effect being significantly different from zero. They also suggest that as bootstrapping is not based on large-sample theory it can be applied with more confidence to small samples. Preacher and Hayes (in press) recommend at least 5000 resamples for the reporting of mediation effects. The macros they provide for the bootstrapping procedure for SPSS v.14 were retrieved from:

<http://www.comm.ohio-state.edu/ahayes/SPSS%20programs/indirect.htm>. For each mediator identified a test of significance was conducted using each of the methods described above and the results reported and commented upon.

3.3.5 Sample Size Considerations

Sample size affects the statistical power of the significance testing and the generalizability of the results. Hair et al. (2006: 197) state that to maintain power at .80 in multiple regression requires a minimum sample of 50 and preferably a sample size of 100 in most research situations. The minimum ratio of observations to independent variables is 5:1, with a preferred ratio of 15:1 to ensure the results are generalizable given that the sample is representative. The maximum number of independent variables in any of the models analyzed is 8, giving a level of 120 observations, which is less than the sample size in the study; 128 observations. This indicates that the results should be generalizable.

Tabachnick and Fidell (2006: 123) provide the following formulae for calculating sample size for testing multiple correlation and testing individual predictors respectively:

$$n = 50 + 8m \quad (\text{Equation 3.5})$$

$$n > 104 + m \quad (\text{Equation 3.6})$$

where, m = number of independent variables

The maximum number of independent variables included in any analysis in this study is 8. The largest values of n calculated from the equations above are 114 and 112. The sample size in the study exceeds these values.

3.3.6 Detection and Treatment of Outliers

Stevens (1984: 334) states that: “because the results of regression analysis can be quite sensitive to outliers (either on Y or in the space of the predictors) it is important to be able to detect such points.” Hair et al. (2007: 74) identify the need to use different methods to detect outliers. For univariate detection they suggest that the distribution of observations for each variable is considered. They define potential outliers as cases that have a standardized score (z score) that is above an upper threshold limit of 2.5 for samples with 80 observations and 4.0 for large samples (Hair et al., 2006: 75). Tabachnick and Fidell (2007: 73) suggest an upper limit of 3.29 ($p < .001$).

For multivariate detection the use of Mahalanobis distance is suggested (Hair et al., 2007: 75; Tabachnick & Fidell, 2007: 75). Tabachnick and Fidell (2007: 74) describe Mahalanobis distance as “the distance of a case from the centroid of the remaining cases where the centroid is the point created at the intersection of the means of all the variables”. Tabachnick and Fidell (2007: 75) explain that Mahalanobis distance is a measure of *leverage*. They also explain that *discrepancy* is a measure of the extent to which a case is in line with the other cases and that the product of *leverage* and *discrepancy* is *influence* which can be assessed by Cook’s distance. Cook’s distance assesses overall influence on the regression equation if a case is deleted. Cases with a Cook’s distance value larger than 1.0 are a potential problem (Cohen et al., 2003: 404; Tabachnick & Fidell, 2007: 75).

A second type of influence statistic is *DFBETA*. Cohen et al. (2003: 404) suggest that this is a very important statistic when interest is focused on specific regression coefficients within an equation. The value of *DFBETA* measures the influence of a case as the change in a specific B_i if the case is deleted. The cut-off value for *DFBETA* is ± 1.0 for small or moderate sized data sets (Cohen et al., 2003: 405).

A further way of detecting the presence of outliers is by inspection of the scatterplot of standardized residuals. Tabachnick and Fidell (2007: 128) define outliers as cases that have a standardized residual of more than 3.3 or less than -3.3 when the sample size is less than 1000 and a criterion of $p = .001$ is adopted. Pallant (2006: 151) comments that in large samples it is not uncommon to find a number of outlying residuals; if only a few are found, it is not necessary to take action.

Once potential outliers are identified, a decision must be made on how to deal with them. Options include retention, modification or deletion. Tabachnick and Fidell (2007: 77) recommend that when outliers are detected their impact can be reduced through transformation of the variable or changing the score on the outlying case so they are not

so deviant. Hair et al. (2006: 76) state: “our belief is that they should be retained unless demonstratable proof indicates that they are truly aberrant and not representative of any observation in the population.” They also recommend that the researcher needs to be aware of instances where results would be substantially changed by deletion of a single or small number of cases (Hair et al., 2006: 222). Cohen et al. (2003: 415) recommend that the tension between missing important information provided by rare cases such as outliers and the accurate characterization of relationships for the nonoutlying cases makes it essential that information on the nature of the outliers and the results of the original regression analysis with all cases included should be reported. They also emphasize that proposing a curvilinear relationship based on a single outlying case is generally a risky practice, with the odds of replication in another sample being very low.

An initial examination of the data was undertaken through examination of z scores for each case for each variable against the value of 3.29. For the variables EE, rPA, LMX, and CF no potential outliers were identified. All cases had z scores below the value of 3.29. DEP had two cases (70 and 22) with z scores above 3.29, with values of 5.26 and 3.68, respectively. OCCSEFF had one case (70) above 3.29 with a value of 3.89. The score for occupational self-efficacy for this case was 45.0 which is lower than the mean of 74.3. Job Demand had one case (45) above 3.29 with a value of 3.35. CONSC had one case (35) above 3.29 with a value of 3.92. For each of the five potential outliers identified, checks were made to ensure that data entry was correct and that the case was legitimate. No reason was found to delete any of the cases.

Leverage is based only on the independent variables (Cohen et al., 2003: 409). Because of this, and as standard regression programs require a regression equation be specified, to evaluate *leverage* Cohen et al. (2003: 409) recommend that “a regression equation analysis be specified that includes all IVs of potential interest and an arbitrary numeric variable that is complete for all cases (e.g. case number) as the DV”. This was done for the six independent variables of Job Demand, CONSC, NEURO, WLCS, LMX and CF. The critical value of Mahalanobis distance for a sample of 128 cases and 6 independent variables is estimated at 25.74 (Barnett and Lewis, 1978; cited in Stevens 1984: 342). Case (70) was again identified, as was case (125). The respective Mahalanobis distances were 27.45 and 30.20. As a further check, leverage values from the regression analysis were compared to the maximum value calculated from the equation 3.7 (Cohen et al., 2003: 410):

$$\text{Cut-off for leverage value} = 3(m + 1)/n \quad (\text{Equation 3.7})$$

where, m = number of independent variables
 n = number of cases

Three cases (23, 70 and 125) were identified as having leverage values above the cut-off value of .164 with values of .197, .225 and .248, respectively. Again, no reason was found to remove any of the cases. In each analysis further checks were made for the

presence of high influence of individual cases through inspection of Cook's distances and *DFBETA* measures. The results of the inspections and actions taken are discussed in the relevant results sections.

3.3.7 Examination of the Distribution of Variables and Transformations Undertaken

Cohen, Cohen, West and Aiken (2003: 110) state that multiple regression analysis makes no assumptions about the distribution of the independent or dependent variables, but does assume that the residuals are normally distributed. They do however state that analysis is most confidently conducted with well-behaved data that meets the underlying assumptions of the basic models tested (2003: 1). Hair et al. (2006: 81) observe that nonnormality of data can have serious effects when sample size is less than 50, but the impact diminishes when the sample size reaches 200 or more. Hair et al. (2006: 82) advise that the normality of all metric variables included in the analysis should be assessed, and both graphical plots and statistical tests should be used. These methods are explained below and results discussed in each of the analyses undertaken.

Graphical Analysis of Normality

The normality of distribution of scores for each variable was assessed by inspecting the histogram of the variable and the normal probability plot which compared the cumulative distribution of the actual data values with the cumulative distribution of a normal distribution. Normality is indicated by the actual distribution being a straight line following the diagonal line of the normal distribution (Hair et al., 2006: 81).

Statistical Analysis of Normality

Statistical analysis for normality can be assessed through examination of the values of kurtosis and skewness for each variable's distribution and calculating the value of the Kolmogorov-Smirnov (K-S) statistic. For the K-S test a non-significant result ($p < .05$) indicates normality. The statistic value (z) for each measure can be calculated using the formulae given by Hair et al. (2006: 81) and must be less than a specified critical value of ± 1.96 (corresponding to a .05 significance level) for the distribution to be normal for that characteristic:

$$z_{\text{Skewness}} = \frac{\text{skewness}}{\sqrt{6/n}} \quad (\text{Equation 3.8})$$

$$z_{\text{Kurtosis}} = \frac{\text{kurtosis}}{\sqrt{24/n}} \quad (\text{Equation 3.9})$$

where, n is the sample size

The normal probability plots were inspected and statistical tests calculated to assess the normality of distribution of metric variables included in the analyses. The values of kurtosis and skewness, the associated statistical value (z), and the significance of the value of the Kolmogorov-Smirnov (K-S) statistic were calculated for each variable and are shown in table 3.15.

TABLE 3.15 Normality Statistics for Variables

Variable	Skewness	Kurtosis	z Skewness (Note 1)	Z Kurtosis (Note 1)	Sig. of K-S statistic (Note 2)
EE	.991	.771	4.51	1.75	.000
DEP	2.41	7.406	10.9	16.8	.000
rPA	.598	-.231	2.72	-.525	.011
Burnout	.586	.481	2.66	1.09	.071
OCCSEFF	.003	1.96	0.01	4.53	.011
Job Demand	.044	1.10	.203	2.55	.009
LMX	-.617	-.311	-2.83	-.713	.000
CF	.899	.578	4.12	1.32	.000
CONSC	-.727	.862	-3.36	1.99	.007
NEURO	.466	.127	2.15	.293	.084
WLCS	.054	.188	.244	.426	.200*

Note 1: Bold type indicates a result below the value of ± 1.96 and normality for that characteristic.

Note 2: Bold type indicates a nonsignificant result and normality of distribution.

* is the lower bound of true significance.

Burnout, neuroticism and work locus of control were found to be normally distributed. Emotional exhaustion, depersonalization, reduced personal accomplishment, occupational self-efficacy, job demand, LMX, communication frequency, and conscientiousness and were found not to have normally distributed scores. Occupational self-efficacy was found to be normally distributed for skewness ($z = -.014$) and to have a positive value of kurtosis, 1.96, ($z = 4.53$). This is not expected to be a problem in the analysis, as underestimates of variance associated with positive kurtosis disappears in samples of more than 100 cases (Tabachnick & Fidell, 2006: 80). Emotional exhaustion, depersonalization, reduced personal accomplishment, job demand and communication frequency were positively skewed. LMX and conscientiousness were found to be negatively skewed.

Non-Linear Transformations

Following the advice of Hair et al. (2006: 236), where possible analyses were conducted for both the original and transformed variables to assess consequences of nonnormality of independent variables on the results. The following formulae suggested by Tabachnick and Fidell (2007: 89) were used to transform the variables.

$$EE^+ = \text{SQRT}(EE) \tag{Equation 3.10}$$

$$DEP^+ = 1 / (DEP + c) \tag{Equation 3.11}$$

where, $c =$ a constant added to each score so the lowest score is 1

$$rPA^+ = \text{SQRT}(rPA) \tag{Equation 3.12}$$

$$JD^+ = \text{LOG}(JD) \tag{Equation 3.13}$$

$$LMX^+ = \text{SQRT}(k - LMX) \tag{Equation 3.14}$$

where, $k =$ largest possible score of LMX + 1

$$CF^+ = \text{LOG}(CF) \tag{Equation 3.15}$$

$$\text{CONSC}^+ = \text{SQRT}(k - \text{CONSC}) \tag{Equation 3.16}$$

where, $k =$ largest possible score of CONSC + 1

The transformed variables EE^+ JD^+ and LMX^+ were found to have K-S statistics of .063 with $p = .200$, .078 with $p = .055$ and .066 with $p = .200$, respectively, indicating normality of distribution of scores (see table 3.16). The transformation of DEP resulted in an improvement in skewness of .008 ($z = .036$) indicating normality for this characteristic. However, the kurtosis was -1.701 ($z = -3.87$) and the K-S statistic was .291, $p = .000$. Inspection of the Q-Q plot indicated nonnormality. Various other transformations were tried, but no better transformation was found. As no general successful transformation was found, it was decided to use a technique described by Cohen et al., (2003: 238) of including a constructed variable (W_i) in the regression equation in each analysis to predict a value of λ as a preliminary estimate for use in a Box Cox transformation of the dependent variable for that analysis. The *constructed variable* (W_i) was calculated from the equation:

$$W_i = Y_i \times \left[\ln \frac{Y_i}{Y_G} - 1 \right] \tag{Equation 3.17}$$

where, Y_G is the geometric mean of the scores in the untransformed dependent variable and was calculated from:

$$Y_G = e^{\sum \ln(Y_i)/n} \tag{Equation 3.18}$$

The constructed variable was then included in the regression equation as an additional predictor. If the unstandardized coefficient for W_i was found to be significant the need for transformation was confirmed (Cohen et al., 2003: 238). The value of λ was calculated from:

$$\hat{\lambda} = (1 - \theta) \quad (\text{Equation 3.19})$$

where, θ is the unstandardized coefficient of the W_i term in the regression equation.

The value of $\hat{\lambda}$ calculated provided a preliminary estimate of λ for substitution into the Box-Cox transformation of Y which is given by:

$$Y_i^{(\lambda)} = (Y_i^\lambda - 1)/\lambda \quad (\text{Equation 3.20})$$

Various transformations were trialled and the P-P plots and scatterplots of regression standardized residuals were inspected before deciding on the value of λ to be used in each analysis. The values of λ are reported in the relevant analyses.

The transformed variable rPA^+ had associated statistical values (z), for skewness and kurtosis indicating normality for these characteristics; $z = -1.15$ and $z = .652$, but a K-S statistics of .088 with a significance of $p = .019$ indicating nonnormality. As this is an important dependent variable in the analyses it was decided to try and find an improved transformation. Cohen et al. (2003: 237) recommend trying values of λ , where the transformed Y^+ is given by the equation:

$$Y^+ = Y^\lambda \quad (\text{Equation 3.21})$$

where, $\lambda < 1$ decreases negative skewness.

In line with their recommendation several values of λ were tried and the distribution of scores for each transformed variable produced inspected in Q-Q plots. Values of z and K-S statistic were also calculated. A value of $\lambda = .70$ was found to give the optimum transformation with values of skewness of .154 ($z = .700$) and kurtosis of -.570 ($z = -1.296$), both of which indicate normality for these characteristics and an improvement over the SQRT (rPA) transformation. The K-S statistic improved from .088, $p = .019$ to .068, $p = .200$ which is at the bound of true significance.

TABLE 3.16 Normality Statistics for Transformed Variables

Variable	Skewness	Kurtosis	Z Skewness (Note 1)	Z Kurtosis (Note 1)	Sig. of K-S statistic (Note 2)
$EE^+ = (EE)^{0.5}$	.211	-.071	.959	-.161	.200*
$DEP^+ = Y_i^{(\lambda)}$ (Note 3)	-	-	-	-	-
$rPA^+ = rPA^{0.7}$	.154	-.570	.700	-1.30	.200*
$JD^+ = \text{LOG}(JD)$	-.601	2.37	-2.78	5.47	.055
$CONSC^+ = (k - CONSC)^{0.5}$	-.103	-.433	-.476	-1.00	.004
$LMX^+ = (k - LMX)^{0.5}$	-.126	-.511	-.577	-1.17	.200*
$CF^+ = \text{LOG}(CF)$	-.035	-.056	-1.60	-1.28	.029

Note 1: Bold type indicates a result below the value of ± 1.96 and normality for that characteristic.

Note 2: Bold type indicates a nonsignificant result and normality of distribution.

* is the lower bound of true significance.

Note 3: Y_i^λ is a Box-Cox transformation of Y, where Y_i^λ is calculated for each analysis through the inclusion of a constructed variable (Wi) in the regression equation to predict a value of λ .

Although the transformed variables CF^+ and $CONSC^+$ had K-S statistics of .084, $p = .029$ and .099, $p = .004$ indicating nonnormality, the z scores indicated normality for the characteristics of kurtosis and skewness; $z = -.016$ and $z = -.128$. The distribution of the Q-Q plots indicated normality in distribution of scores as shown in figures A-3.1 and A-3.2 (see appendix 3.3). It was decided to use these transformations in the analyses. As cautioned by Cohen et al. (2003: 247), checks were made for extreme outliers produced from the transformation of the variables. The presence of outliers was checked by examination of z scores for each variable against the upper limit of 3.29 given by Tabachnick and Fidell (2007: 73). All cases had z scores below the value of 3.29 for the transformed variables, except for case 45 for the transformed variable job demand which had a value of $z = 4.12$. Before the transformation this case (45) had a z score of 3.35 for the variable job demand. As the z score is only slightly above the limit of 4.0 suggested by (Hair et al., 2006: 75), previously no reason was found to remove the case, and the transformation was successful in achieving a normal distribution of scores, it was decided to use this transformation and to include the case in the analysis.

3.3.8 Normality, Linearity, and Homoscedasticity of Residuals

Cohen et al. (2003: 125) suggest that graphical examination of residuals is a very useful way to identify problems in the analysis. They suggest that examination of the normal probability plot of the residuals provides an excellent method of determining whether the residuals follows a normal distribution and whether assumptions have been violated (Cohen et al., 2003: 138). No major deviation from normality is indicated by the points lying in a reasonably straight line diagonal from bottom left to top right. Another important implicit assumption of multiple regression is that of linearity (Hair et al., 2006: 85). As a prudent first step in each analysis, relationships were examined between independent variables to identify any non-linear relationships between them. This was done by examining variable scatterplots and also by examining the residuals' scatterplot as advised by Tabachnick and Fidell (2007: 125). Assumptions are met when the residuals are distributed rectangularly with a concentration of scores at the centre (along the 0 point) (Tabachnick & Fidell, 2007: 127). Failure of linearity of residuals would not invalidate an analysis, but would weaken it (Tabachnick & Fidell, 2007: 127).

The assumption of homoscedasticity is the assumption that standard deviations of errors are approximately equal for all predicted dependent variable scores. Failure to achieve homoscedasticity in scores, again, does not invalidate the analysis, but weakens it (Tabachnick & Fidell, 2007: 127). Serious heteroscedasticity is indicated from the plot when the spread in standard deviations of residuals around the predicted values is three times higher for the widest spread than for the narrower spread (Fox, 1991; cited in Tabachnick & Fidell, 2007: 127). In each analysis the normal probability plot and scatterplot of the residuals are examined and commented upon.

3.3.9 Mean-Centering of Variables

The inclusion of interaction terms in the models analyzed could lead to concerns of collinearity. Brambor, Clark and Golder (2006: 71) argue that multicollinearity has been overstated as a problem in interaction models and state that while "some scholars have argued that "centering" the relevant variables can mitigate any multicollinearity issues that exist. This is simply not true." Other authors (Aiken & West, 1991: 35; Jaccard & Turrisi, 2003: 28; Tabachnick & Fidell, 2007: 157) argue that independent variables should be centered for reasons of consideration of multicollinearity between lower and higher-order terms. Cohen et al. (2003: 203) state that *nonessential multicollinearity* that exists due to scaling is removed through centering of variables and state that: "centering leads to computational advantages." Further, the scales of LMX, Communication Frequency, Conscientiousness, Neuroticism, Work Locus of Control and Occupational Self-Efficacy all have scales which do not have a meaningful zero point. Cohen et al. (2003: 34) recommend that variables that do not have a meaningful zero point should be centered to simplify interpretation of the results. Also, mean centering variables has benefits from the consideration of interpretation of the coefficients (Aiken & West, 1991: 48). Thus, from considerations of multicollinearity and interpretation, the

recommendation made by Cohen et al. (2003: 266) “that continuous predictors be centered before being entered into regression analysis containing interactions” is followed. Predictor variables are mean-centered using the following equation:

$$\text{Centered predictor } x_i = (X_i - M_x), \quad (\text{Equation 3.22})$$

where, M_x is the mean of X

Dependent variables were left uncentered as there is no advantage in centering them (Aiken & West, 1991: 35). Also, leaving the dependent variables in their original form gives predicted scores in the original scale of the dependent variable, which is more convenient for interpretation (Cohen et al., 2003: 266).

TABLE 3.17 Descriptive Statistics for Variables

Variable	Mean	s.d.
Emotional Exhaustion (EE)	14.6	8.57
Depersonalization (DEP)	1.73	2.52
reduced Personal Accomplishment (rPA)	13.6	8.72
Burnout (MBI)	29.9	14.3
Occupational Self-Efficacy (OCCSEFF)	74.3	7.53
Job Demand (JD)	120.1	14.5
Leader-Member Exchange (LMX)	25.3	6.73
Communication Frequency (CF)	9.95	3.59
Conscientiousness (CONSC)	37.4	5.21
Neuroticism (NEURO)	18.8	6.13
Work Locus of Control (WLCS)	59.9	7.21

3.9.10 Multicollinearity

To reduce the risk of multicollinearity Tabachnick and Fidell (2007: 90) recommend including in the same analysis only independent variables with a maximum value of bivariate correlation of less than 0.7. Bivariate correlations were examined in each analysis and the maximum values reported. Also, as previously mentioned above, predictor variables were centered for reasons of consideration of multicollinearity between lower and higher-order terms. As part of the multiple regression analysis, collinearity diagnostics were performed, and the values of Variance Inflation Factor (VIF) for each variable were examined. Pallant (2006: 150) states that VIF values below 10 indicate that multicollinearity should not be a concern. Hair et al. (2006: 230) mentions that a common cut-off value is 10, but cautions that particularly when sample

size is small, multicollinearity results in a large increase in standard errors and researchers may need to be more restrictive so as to be able to represent and understand the effects of individual independent variables. They mention that even at relatively low levels of multicollinearity of .30, the process for identifying the unique effects of independent variables becomes increasingly more difficult (Hair et al., 2006: 229). Cohen et al. (2003: 423) state that they believe that the common rule of thumb guideline of 10 is too high and that interpretation of the regression coefficients may become problematic at considerably smaller values of VIF. Cohen et al. (2003: 424) state that “there is no good statistical rationale for the choice of any of the traditional rule of thumb threshold values for separating acceptable from unacceptable levels of multicollinearity” and suggest two basic checks (Cohen et al., 2003: 425):

1. to investigate whether outliers are present that increase the relationship between independent variables by examine the leverage of each case, and
2. by comparing the results of the simple univariate regression analyses where the dependent variable is regressed separately onto each of the independent variables to the results of the full equation. Large changes in direction and magnitude of the coefficients indicate a substantial multicollinearity influence.

The values for VIF are inspected and the implications for the interpretation of results are discussed in each analysis.

3.4 COMMON-METHOD VARIANCE

Although one measure (job demand) was obtained from the Office of National Statistics (ONS), the majority of the other measures of LMX as perceived by the employee, the individual personality traits of conscientiousness, neuroticism, work locus of control and the personal outcomes of burnout and self-efficacy could only be obtained by asking the individuals in the study directly. Due to concerns on response rates and because the separation of the measurement of variables could potentially allow the intrusion of contaminating factors, responses were obtained along with the measure of communication frequency in a single survey. As self-report questionnaires were used to collect data at the same time from the same participants, common-method variance (CMV) could be a reason for concern (Podsakoff & Organ, 1986). Reliance is placed on the comments of a number of authors who have commented that the CMV problem may be overstated (Crampton & Wagner, 1994; Lindell & Whitney, 2001; Spector, 1987; Spector, 2006) and post hoc statistical investigations were conducted to see if CMV was a major concern in any of the analyses. It should also be noted that the questionnaire used conformed to a number of the procedural remedies to control for CMV, as suggested by Harrison, McClaughlin and Coalter (1996), Lindell and Whitney (2001) and Podsakoff, MacKenzie, Lee and Podsakoff (2003).

3.4.1 Procedural Remedies to Control for CMV

Protection of Respondent Anonymity and Reduction of Evaluation Apprehension.

Respondents were assured of anonymity and confidentiality in the study, and were reassured that there were no right and wrong answers, but were asked to answer as honestly as possible. Podsakoff et al. (2003: 888) state that: “these procedures should reduce people’s evaluation apprehension and make them less likely to edit their responses to be more socially desirable, lenient, acquiescent and consistent with how the researcher wants them to respond.” As social desirability was not measured in the study, reliance must be placed on the findings of Moorman and Podsakoff (1992) that social desirability effects do not seem to be very widespread, as well as Spector’s (1987) findings that social desirability is usually not a source of method bias in the measurement of work attitudes and perceptions. These findings are specifically supported by research indicating a lack of effect by social desirability for the MBI scale (Cordes & Dougherty, 1993; Maslach & Jackson, 1981) and for the WLCS scale (Blau, 1993; Chung & Ding, 2002; Johnson et al., 1984; Spector, 1988). Further, in a meta-analytical review, Ones, Viswesvaran and Reiss (1996) found that social desirability did not predict task performance, counter-productive behaviour or job performance. However, a correlation between social desirability and personality measures was found, with the two highest values of the Big Five dimensions being emotional stability ($r = .37$, $n = 143,794$) and conscientiousness ($r = .20$, $n = 46,972$). This led them to comment that: “The most important finding of this meta-analytic review is that scores of social desirability scales reflect individual differences in personality variables. Ability to respond in a socially desirable manner appears to relate consistently to emotional stability and conscientiousness of individuals. As such, partialing social desirability from personality scale scores is likely to remove some true variance from the measures of personality” (Ones et al., 1996: 669).

Improvement of Scale Items. Care had been taken to examine the construction of items to ensure that ambiguous, vague and unfamiliar terms for the respondents were not present. This is expected to have reduced problems in the comprehension stage of the response process. Further, Podsakoff et al. (2003) suggest that: “another way to diminish method biases is to use different scale endpoints and formats for the predictor and criterion measures.” This is expected to reduce method biases caused by commonalities in scale endpoints and anchor effects. The criterion variable of burnout was measured with a different format and endpoint scale to the predictor variables.

Counterbalancing Question Order. The questions measuring the personality traits of neuroticism and conscientiousness were counterbalanced in order.

Questionnaire Length. Lindell and Whitney (2001) identify that if respondents feel that a questionnaire is excessively long or repetitive they are likely to suffer from transient mood states such as boredom and fatigue. They suggest that when this occurs

respondents will reduce their cognitive effort and move from a focus on response accuracy to response speed. As this occurs they may be more easily influenced by peripheral cues, distortion in the direction of consistency with previous responses and stereotypical responses. Harrison et al. (1996: 248) state that respondents adopt a “cognitive miser” principle when filling in a questionnaire and will minimize their cognitive effort. They suggest that respondents construct their answers from response cues (such as previous answers) and information that is available in short-term memory as long as some threshold of relevance is exceeded. They observe that as more items are included in a scale the accessibility of answers on a previous scale will reduce in short-term memory. Great care had been taken to keep the questionnaire as short as possible whilst using an adequate number of items to measure each construct. Pilot exercises were conducted to check the time required for completion; which was estimated to be around fourteen minutes. Also, in line with the recommendation by Lindell and Whitney (2001), the demographic items had been placed at the end of the questionnaire.

3.4.2 Statistical Investigation of CMV in the Analyses

To investigate whether CMV was a major problem a Harman single factor test was conducted (Podsakoff et al., 2003). All items from each of the constructs in each analysis were loaded into an exploratory factor analysis and the unrotated factor solution was examined to determine the number of factors necessary to account for the variance in the variables. If one single factor does not emerge or one general factor does not account for a majority of the covariance between the measures, it is assumed that CMV is not a major problem. The results of the Harman single factor test are reported in each analysis. Overall there was evidence that CMV is not a pervasive problem. No single factor accounted for the majority of the covariance in any of the analyses, suggesting that CMV is not solely responsible for the findings. Moreover, common-method bias would not explain the many interactive and curvilinear relationships between predictor and outcome variables found in this study. Also, many of the correlations were found to be non-significant, which suggests that there is not a pervasive underlying bias influencing the results.

CHAPTER 4

THE RELATIONSHIPS BETWEEN LMX AND COMMUNICATION FREQUENCY, AND THE PERSONAL OUTCOMES OF BURNOUT AND OCCUPATIONAL SELF- EFFICACY

4.1 INTRODUCTION

An individual's immediate manager is often the most immediate and salient person in the work place for employees and likely to have a direct influence on their behaviour (O'Driscoll & Beehr, 1994). Leaders are an important source of information for employees, play a significant role in their sense making (Daft & Weick, 1984; Thomas et al., 1993) and influence their perceptions of relevant organizational features, events and processes (Kozlowski & Doherty, 1989).

In this chapter, the relationships between employees' perception of the quality of the relationship with their manager and their communication frequency on each of the components of burnout, the unidimensional measure of burnout, and occupational self-efficacy are investigated. In answer to the call from Harris and Kacmar (2006), the possibility of negative outcomes for employees in high-quality LMX relationships is examined and if the relationship between LMX and burnout is curvilinear is tested. The impact of job demands on burnout and the possible buffering effects of LMX and communication frequency on the relationship between job demands and burnout as called for by Bakker et al. (2005) is investigated. The assumption that more communication between an employee and their manager is always better for the employee, as called for by Kramer (2004), is examined. Interaction effects between LMX and communication frequency and their relationships with each of the components of burnout and occupational self-efficacy are investigated and if the importance of LMX to outcomes is dependent on communication frequency as found by Kacmar et al. (2004) is examined for two new outcomes of burnout and occupational self-efficacy.

4.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES

4.2.1 LMX and Burnout

The social context of the work place has been identified as an important factor in employee well-being (van Dierendonck et al., 2004). Buunk and Schaufeli (1993: 53), when addressing the subject of burnout from a perspective of social comparison theory, state: "our central thesis is that burnout develops primarily in a social context, and that to understand the development and persistence of burnout attention has to be paid to the way individuals perceive, interpret, and construct the behaviours of others at work." (see chapter 2, section 2.1 for a discussion and review of the literature on burnout). Cordes et

al. (1997) also argue for interpersonal interactions being a key construct in the burnout process. Maslach (1993) suggests that there are many interesting questions that need to be addressed in terms of the impact of social power, interpersonal relationships and communication on burnout. In her original book Maslach (1982) identified that supervisors were influential in shaping the nature and role of employees and that supervisors' actions could hasten or alleviate burnout in employees. Cherniss (1980: 113) suggests that "of all the social interactions that influence job stress and the coping process in human service settings, the relationship between the supervisor and the worker is especially important."

Despite the fact that leadership is one of the most discussed topics in social science research (Bligh & Meindl, 2005; Hogan, 2004) little is known about the effect that different leadership styles have on follower stress levels (Smith & Cooper, 1994), and there have been few studies into the impact of supervisory behaviour on employee well-being (van Dierendonck, Haynes, Borrill & Stride, 2004). The research into leadership and burnout is limited (Halbesleben & Bowler, 2007; Hetland et al., 2007; Seltzer & Numerof, 1988). Seltzer and Numerof (1988) have argued strongly for further research into the effect of supervisor behaviour on subordinate burnout. Prior research has indicated that employee perceptions of poor leadership have a large effect on burnout (Gabis & Ihrke, 1996). Burnout has been found to be negatively related to consideration behaviour from the leader (Seltzer & Numerof, 1988) and leader visioning behaviour (Densten, 2005), and supervisory support has been found to be an important variable in the study of the relationship between job characteristics and burnout (Rafferty, Friend & Landsbergis, 2001). Other researchers have found either a lack of relationship between leadership and burnout, or a positive relationship. For example, Mazur and Lynch (1989) found that the leadership style of head teachers was not a significant predictor of teacher burnout while work-overload, isolation and personality characteristics were (the impacts of personality on burnout are investigated in chapters 5 and 7).

One of most popular models for studying leadership is Bass and Avolio's (1984) framework of transformational leadership (Gerstner & Day, 1997). Prior studies of burnout using this framework have produced mixed results. A study by Stordeur, D'hoore and Vandenberghe (2001) found that transformational leadership was negatively related to emotional exhaustion. A more recent study by Hetland et al. (2007) found that transformational leadership was not significantly related to emotional exhaustion, but was negatively related to cynicism (similar to depersonalization) and reduced professional accomplishment. Seltzer, Numerof and Bass (1989) found that a leadership style which only focused on providing attention when standards were not met (management by exception) and the component of transformation leadership of *intellectual stimulation*, led to higher levels of burnout. In two further studies (Podsakoff, MacKenzie & Bommer, 1996; Podsakoff, MacKenzie, Moorman & Fetter, 1990) findings supported that leaders communicating high expectations to followers

may have detrimental effects for followers. In the first study, Podsakoff et al. (1990) found that *intellectual stimulation* was negatively related to employee trust and satisfaction. Moreover, another component of transformational leadership, *high performance expectations*, was associated with lower levels of employee trust. In the second study, Podsakoff et al. (1996) found that *intellectual stimulation* and *high performance expectations* increased role conflict, and *high performance expectations* decreased employee satisfaction.

Gerstner and Day (1997) argue that LMX theory (see section 2.3) incorporates both transactional and transformational behaviour. Maslyn and Uhl-Bien (2001) suggest that in low-quality LMX relationships, leadership will be transactional, while in high-quality relationships leadership will be transformational. Prior research has found that LMX and transformational leadership are highly correlated. Wang, Law, Hackett, Wang and Chen (2005) and Piccolo and Colquitt (2006) found correlations of $r = .71, p < .01$ and $r = .70, p < .05$, respectively. LMX theory focuses on the relationship between an employee and their manager, and provides a framework that reflects the complex nature of this interaction (Nelson et al., 1988).

LMX theory assumes that leaders form different relationships with each of their employees (Graen & Uhl-Bien, 1995; Sparrowe & Liden, 1997) and that effective leadership processes occur when leaders and followers develop positive relationships and gain access to the benefits that these relationships provide (Graen & Uhl-Bien, 1995), such as loyalty, information, emotional support and respect (Sparrowe & Liden, 1997). LMX has been found to influence employees' attitudes and perceptions of the organizational environment, and is increasingly being used to understand the processes that affect employee outcomes (Davis & Gardner, 2004). For these reasons LMX theory is adopted in this investigation of leadership and burnout. The argument of Meindl (1995) is followed, that it is the individual's perspective of the manager's personality and behaviour that influences the employee, and measure LMX from the employee's perspective.

The conservation of resources model of burnout (Hobfoll, 2001; Hobfoll & Freedy, 1993) (see section 2.1.6) suggests that psychological stress occurs when an individual's resources (the objects, personal characteristics, conditions or energies that are valued by an individual) are threatened with loss and that burnout occurs when work demands consume resources at a greater rate than the individual can replenish them. Major demands include high workload and pressure, role ambiguity, role conflict, and the occurrence of stressful events. Major resources include social support and job enhancement opportunities such as participation in decision-making and autonomy. Due to the hierarchical structure of most organizations, an individual's manager will be influential in determining the individual's role (Dienesch & Liden 1986), and will have the power to decide how to allocate resources, support and opportunities among their employees (Sparrowe & Liden, 1997). Bass (1981) comments that leaders may

substantially reduce stress in employees by making their roles clear and free from conflict or ambiguity, by providing guidance on goals and priorities, removing impediments for goal achievement, through the provision of support and through appraisal and long-term planning to avoid stressful events and future defective coping.

In the exchange relationship between an employee and a manager, Dienesch and Liden (1986) and Liden and Maslyn (1998) argue that each party will assess the relationship based on the perceived contribution of the other person, and on the quality and amount of effort they have invested. Graen and Uhl-Bien (1995) argue that obligation is a key dimension of the LMX relationship and comment that while employees in high-exchange relationships receive higher levels of opportunity, more valued resources such as autonomy and more of the leader's time and support, they will feel that they have to reciprocate with high level of contribution, effort and energy. In low-quality exchanges, the employee's contract is based largely around the employment contract (Graen & Uhl-Bien, 1995) and they do what is required of them and little more (Northouse, 2004). Employees in high-quality exchanges assume greater responsibility and contribute more (Liden & Graen, 1980). They invest extra effort and look for innovative ways to advance the shared agenda, and work far beyond their job description (Northouse, 2004). Prior research has found that the quality of the LMX relationship is related to the amount of effort that the individual is prepared to put in (Maslyn & Uhl-Bien, 2001) and to levels of organizational citizenship behaviour undertaken (Deluga, 1994; Greguras & Ford, 2006; Ilies et al., 2007; Wayne & Green, 1993).

The relationship between higher work load and burnout, in particular with the component of emotional exhaustion, has been consistently demonstrated by prior research (see, for example, Cordes & Dougherty, 1993; Lee & Ashforth, 1996; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Schaufeli & Enzmann, 1998). As employees in high-quality LMX relationships will have higher workloads than those in low-quality exchanges, have an obligation to invest more effort and energy and may be required to undertake jobs and tasks whose criticality and difficulty may start to exceed their capacities and resources, it may be that individuals in high-quality LMX relationships are exposed to the risk of higher levels of burnout. However, prior research has indicated that LMX is related to employee well-being (see, for example, Epitropaki & Martin, 2005; Martin et al., 2005). Individuals in high-quality LMX relationships receive higher levels of valued resources (Graen & Uhl-Bien, 1995) and formal and informal rewards (Sparrowe & Liden, 1997), and burnout will only occur when demands exceed available resources. The conservation of resources theory and the primacy of loss argument (Hobfoll & Freedy, 1993) suggest that individuals are sensitive to potential losses of resources and lack of adequate returns on investments. As LMX relationships develop over time and occur through negotiated and reciprocated exchanges with a deepening sense of mutual trust, respect and obligation for each other,

as each party responds to the invitations and investments of the other (Graen & Uhl-Bien, 1995), it seems unlikely that an employee will invest their resources beyond a limit that will result in them starting to suffer from burnout.

Conger and Kanungo (1988) suggest that managers can reduce employee anxiety and stress by clearly defining the employee's role and responsibility. Significant prior research has consistently confirmed the relationship between role stressors such as role ambiguity and conflict, and stress (see, for example, Beehr, 1976; Kemery, Mossholder & Bedeian, 1987; O'Driscoll & Beehr, 1994; Schaubroeck, Cotton & Jennings, 1989). In their meta-analysis of research on role ambiguity and role conflict in the work place, Jackson and Schuler (1985) found that role ambiguity and role conflict were positively correlated to "tension/anxiety". Research by Cordes and Dougherty (1993) found that role overload and role ambiguity are important antecedent factors to the development of burnout. In their meta-analytic examination of the correlates of the three dimensions of burnout, Lee and Ashforth (1996) found that emotional exhaustion and depersonalization were negatively correlated to role clarity. A meta-analytical study by Pfennig and Husch (1994; cited in Schaufeli & Enzmann, 1998: 82) found that role conflict and role ambiguity were strongly correlated to emotional exhaustion and less strongly correlated with depersonalization and personal accomplishment. As prior research has found LMX to be negatively related to role conflict and ambiguity (Nelson et al., 1988) it is expected that LMX will be negatively related to all three components of burnout. Further, Pearce (1981) posits that role ambiguity occurs when the information available to the employee is deficient. As intra-dyadic communication is essential to LMX development and high-quality exchanges are characterized by frequent interaction (Bauer et al., 2006) and individuals in high-quality exchanges receive more information (van Dam et al., 2008) it is expected that LMX will be negatively related to burnout.

The positive impact of social support for the reduction of employee burnout is predicted by Leiter's (1990) process model of burnout (Leiter, 1993), the conservation of resources model (see section 2.1.6), and the job demands-resource model of burnout (Demerouti et al., 2001; Schaufeli & Bakker, 2004) (see section 2.1.7). A number of studies have shown that supervisor support has a stronger effect on employee stress levels than co-workers (Albrecht & Adelman, 1984). For example, research by Ganster, Fusilier and Mayes (1986) found that support from the supervisor was more important in reducing worker strain than support from co-workers or friends. In a study of sources of support to teachers Russell, Altmaier and van Velzen (1987) found that the only source of support that was significantly (negatively) related to burnout was that from the supervisor. Support from co-workers, partners and friends did not significantly predict burnout. They found that teachers with supportive supervisors had lower levels of emotional exhaustion, depersonalization and reduced personal accomplishment. Social support from the immediate supervisor has been found to be negatively related to

emotional exhaustion in human service professionals (Lee & Ashforth, 1993) and personal accomplishment in public service lawyers (Jackson, Turner & Brief, 1987). In their meta-analysis Lee and Ashforth (1996) found that emotional exhaustion and depersonalization were negatively correlated with support from the supervisor. Halbesleben (2006) predicted that, as demands are most closely tied to emotional exhaustion and supervisors are in a position to offer suggestions to reduce or even directly reduce demands, work-related support from the supervisor can be expected to be strongly related to emotional exhaustion. In a meta-analytical analysis they found support for this hypothesis.

Employees in high-quality LMX relationships receive more of the leader's time and support than those in low-quality relationships (Graen & Uhl-Bien, 1995). One of the dimensions of LMX identified by Dienesch and Liden (1986) is loyalty. This can be considered as the degree to which each member of the exchange will protect the other from outside forces in their environment (Dienesch & Liden, 1986), implying that when faced with difficult situations employees in high-quality LMX relationships can rely on their managers for emotional support (Dienesch & Liden, 1986; Sparrowe & Liden, 1997). Also, LMX has been found to affect an individual's perceptions of organizational support (Wayne et al., 1997). In high-quality LMX relationships managers may introduce the employee to key people in their social network which could lead to additional information being available, as well as to other forms of support and resource availability (Sparrowe & Liden, 1997).

In her existential model of burnout Pines (1993) argues that the root cause of burnout is the failure of existential meaning when an individual comes to feel that their efforts and actions are insignificant and meaningless. Burisch (1993) argues that when people lose autonomy they are likely to question the meaning of their lives. Leiter's (1991) process model of burnout predicts that participation in decision making will be positively related to personal accomplishment, and the job demands-resource model suggests that participation will be negatively related to depersonalization. Participation in decision making has been found to be an important factor in reducing job-related strain (Jackson, 1983), and participation in decision making and autonomy have been consistently found to be related to all three dimensions of burnout (Schaufeli & Enzmann, 1998). In their meta-analysis Lee and Ashforth (1996) found that participation in decision making and autonomy were both negatively related to the three components of burnout. Also, Bakker et al. (2005) found that autonomy buffered the impact of work overload on emotional exhaustion. LMX has been found to be positively related to levels of participation in decision making (Nelson et al., 1988), autonomy (Schriesheim et al., 1998), levels of job involvement (Greguras & Ford, 2006) and delegation by the supervisor (Schriesheim et al., 1998). In a longitudinal study, Bauer and Green (1996) found that while LMX and the level of delegation were related, good performance by the employee preceded delegation by the leader.

At the time of writing this dissertation the author is only aware of two prior studies of LMX and burnout. In the first of these, Thomas (2005) studied the effects of LMX and mentoring on socialization, role stress and burnout in 428 employees of a medium-sized hospital in the south-eastern United States. LMX was measured using the seven-item measure of Graen, Novak, and Sommerkamp (1982), while burnout was measured using the Form A part of the Gillespie-Numerof Burnout Inventory which assesses the emotional exhaustion dimension of burnout (Gillespie & Numerof, 1984). Analysis of the data using structural equation modelling indicated that LMX had significant direct and indirect effects on burnout. In the second study, Bakker et al. (2005) examined the buffering of job demands on burnout by job resources in 1012 employees of a large institute for higher professional education in the Netherlands. LMX was measured with an adaptation of Graen and Uhl-Bien's (1991) LMX scale with five items. The three components of burnout were measured with the Maslach Burnout Inventory (Schaufeli, Leiter, Maslach & Jackson, 1996). Using hierarchical regression analysis they found that LMX was negatively related to all three components of burnout, and that LMX moderated the effects of work overload and physical demands on emotional exhaustion. They called for further research to replicate the findings in different settings.

From consideration of the relationships between LMX and job demands (workload, energy and effort expended, role ambiguity and role conflict), and individual's resources (social support from the supervisor, autonomy and participation in decision making) and each of these with burnout and its components, and from review of relevant prior research, it is predicted that the quality of the LMX relationship with the supervisor will be negatively related to the each of the components of burnout experienced by the employee and to the unidimensional measure of burnout. The following hypotheses are therefore proposed for investigation:

- Hypothesis 1*** *The quality of the LMX relationship is negatively related to emotional exhaustion.*
- Hypothesis 2*** *The quality of the LMX relationship is negatively related to depersonalization.*
- Hypothesis 3*** *The quality of the LMX relationship is negatively related to reduced personal accomplishment.*
- Hypothesis 4*** *The quality of the LMX relationship is negatively related to burnout.*

While it is not argued that there will be a positive relationship between LMX and burnout, it may be that at some point the benefits and resources provided by a high-LMX relationship can be exceeded by the demands placed upon the individual. This implies that the relationship will be curvilinear. A small number of studies have provided evidence that this may be the case in some contexts. Research by Vecchio and

Gobdel (1984) of bank tellers found that individuals in the middle-group reported higher levels of satisfaction with their supervisor than those in the low or high-LMX groups. Research by Kramer (1995) examined supervisor-subordinate communication during job transfers and found that although employees in low-LMX relationships reported higher levels of stress after one month than those in high relationships, the employees in the middle-LMX relationship group reported the lowest levels of stress and the highest levels of job satisfaction. In two samples of employees in the United States Harris and Kacmar (2006) found some evidence that the relationship between LMX and stress was curvilinear, characterized by a U shape with an initial downward sloping curve that reached an inflection point and minimum value for burnout before turning upwards at higher levels of LMX. As emotional exhaustion is closely associated with stress (Cordes & Dougherty, 1993; Maslach, 1993) it may be that the relationship between LMX and emotional exhaustion is curvilinear, too. Perhaps as Albrecht and Adelman (1987a: 13) suggest, “supportive ties can be at once helpful and harmful; people in supportive relationships can experience relational binds that place a high price on the support they so desperately need.” To meet the call from Harris and Kacmar (2006) for further research into whether there are negative outcomes for employees in high-quality LMX relationships the following hypothesis is included for investigation:

Hypothesis 5 *The relationship between the quality of the LMX relationship and emotional exhaustion is curvilinear.*

Bakker et al. (2005) found that LMX moderated the role of work overload on emotional exhaustion and called for further research to replicate their findings in different settings. Bakker et al. (2005) measured work overload with three items in a self-report questionnaire from employees of a large educational institution. In this study a different setting is studied and a hard statistic is utilized as a proxy for the level of job demand or pressure experienced by the employee (see section 3.2.7). The following hypotheses are proposed for testing:

Hypothesis 6 *The relationship between job demand and emotional exhaustion is moderated by the quality of the LMX relationship.*

Hypothesis 7 *The relationship between job demand and burnout is moderated by the quality of the LMX relationship.*

Contact frequency has been found to be an important factor in influencing individual's attitudes and views. For example, research by Redman and Snape (2002) into ageism in teaching, found that the frequency of contact with older teachers was negatively related to discriminatory attitudes in individuals. The more young teachers

met older teachers, the less discriminatory they became. Of particular interest to the present study is the research by Kacmar et al. (2004). They hypothesized that the importance of LMX would depend on how frequently managers and employees interact. In studies of 188 private and 153 public sector workers, they found that the relationship between LMX (perceived by the employee) and supervisor job-performance rankings of the employee was moderated by communication frequency. LMX was more strongly related to job-performance ratings for employees reporting more frequent communication with the supervisor than those with a low communication frequency. In high-quality relationships employees with high communication frequency with the supervisor had higher job-performance ratings than those with lower communication frequency. Employees in low-quality LMX relationships with high communication frequency had worse job-performance rankings than those with infrequent communication. As previously mentioned, while it is clear that support from the supervisor is a key resource for an employee (see above), it seems reasonable to expect that the impact and amount of support provided will be dependent on the frequency of interaction. Thus, the following hypotheses are proposed for investigation:

- Hypothesis 8** *The relationship between LMX and emotional exhaustion is moderated by communication frequency.*
- Hypothesis 9** *The relationship between LMX and depersonalization is moderated by communication frequency.*
- Hypothesis 10** *The relationship between LMX and reduced personal accomplishment is moderated by communication frequency.*
- Hypothesis 11** *The relationship between LMX and burnout is moderated by communication frequency.*

4.2.2 Communication Frequency and Burnout

In their communication theory perspective on social support, Albrecht and Adelman (1987b) argue that social support is a communication phenomenon. They argue that people engage in supportive interactions in a search for human contact and meaning, and in an attempt to make sense of their circumstances. Employees are more likely to seek social support for work place issues from supervisors or co-workers, rather than friends or family, as supervisors and co-workers have a better knowledge of stressors in the work place which are often complex (Ray, 1987). Uncertainty Reduction Theory (URT) (Berger & Calabrese, 1975) suggests that when individuals experience a lack of predictability in a situation or with a person they will seek information to reduce the uncertainty. Research has confirmed that individuals are active seekers of feedback information (Ashford & Cummings, 1983) and that managers are more active in seeking feedback from superiors than employees or peers (Ashford & Tsui, 1991).

A deficiency of information will lead to an employee experiencing unpredictability in terms of goals, consequences, role behaviours and resource availability. Pearce (1981) posits that when the information available to the employee is deficient the employee will experience role ambiguity. Role ambiguity has been found to be an important antecedent factor to the development of burnout (Cordes & Dougherty, 1993). It is therefore likely that a deficit of information will be related to employee burnout. Prior research has found feedback and frequency of communication to have a strong negative correlation with role ambiguity (Andrews & Kacmar, 2001; Jackson & Schuler, 1985; Johlke & Duhan, 2001) and to contribute to employee well-being (van Dierendonck et al., 2004). Moreover, information seeking by employees has been found to be positively related to employee satisfaction, and negatively to turnover intentions (Morrison, 1993).

A further argument for a negative relationship between burnout and communication frequency is as follows: as individuals suffer from higher levels of emotional exhaustion they will tend to withdraw from the situation at work as a coping strategy (Lee & Ashworth, 1993), and they will become more cynical and detached (Demerouti et al., 2001). Moreover, they are less likely to seek interaction with their manager. Also, as they become more cynical the manager is less likely to seek interaction with them as people tend to interact more frequently with positive individuals as these interactions are more pleasant (Buunk & Schaufeli, 1993). Research by Buunk and Schaufeli (1993) found support for the tendency for individuals under stress to avoid others. Longitudinal research by van Dierendonck et al. (2004) found support for a two-way reciprocal process between employee well-being and leadership behaviour. They (van Dierendonck et al., 2004) found that as employees become more stressed they became more negative, which resulted in a decrease in supportive behaviour by their manager.

Many authors have argued that communication is a critical element of social support in the reduction of stress in the work place (see, for example, Albrecht & Adelman, 1987a; Andrews & Kacmar, 2001; Fenlason & Beehr, 1994; Ray, 1987). Schaufeli and Enzmann (1988) comment that there are only a few studies available on feedback and burnout, and the results are consistent. Meta-analysis of six studies showed that a lack of feedback was positively related to all three components of burnout (Pfennig & Husch, 1994; cited in Schaufeli & Enzmann, 1996: 83). In a more recent study, Bakker et al. (2005) found that feedback from the supervisor was negatively related to all three components, and moderated the relationship between work overload and emotional exhaustion. It is expected that the level of communication frequency between the employee and the supervisor will be negatively related to the level of burnout experienced by the employee and the following hypotheses are proposed for investigation:

-
- Hypothesis 12** *Communication frequency is negatively related to emotional exhaustion.*
- Hypothesis 13** *Communication frequency is negatively related to depersonalization.*
- Hypothesis 14** *Communication frequency is negatively related to reduced personal accomplishment.*
- Hypothesis 15** *Communication frequency is negatively related to burnout.*

Relationships in the work place are fundamental for employee well-being, but may also in certain circumstances be a source of support or stress (Maslach, 1982; Pines & Aronson, 1988). Employees may be exposed to rewarding and empowering relationships or negative relationships (Davis & Gardner, 2004). Albrecht and Adelman (1984) observe that a fundamental requirement for well-being is that of *supportive* communication. Feedback is important to employees as it helps them to understand how well they are performing and also lets them know that their work is appreciated and valued (Maslach, 1982). Unfortunately, due to the accountability of supervisors for targets and productivity, and a tendency to focus on these issues due to the limited time availability, positive feedback to employees is often minimal or absent, and negative feedback predominates. The feedback that does occur is often poorly handled and critical rather than useful or constructive (Maslach, 1982). Research by Basch and Fisher (2000) in a study of hotel chain employees, found that personal contact and interaction with their manager led to feelings of disappointment, frustration, anger and hurt more often than difficult customers, work pressure or personal problems.

High-quality LMX exchanges are characterized by loyalty and the mutual affection between managers and employees (Dienesch & Liden, 1986; Liden & Maslyn, 1998; Maslyn & Uhl-Bien, 2001). Employees in high-quality LMX exchanges report higher levels of satisfaction with their manager (Greguras & Ford, 2006; Schyns & Croon, 2006). Supervisor liking of the employee has been found to be an important antecedent factor for LMX development (Liden et al., 1993; Wayne et al., 1997), so it can be expected that the communication in high-quality LMX relationships will be friendly and positive. Prior research has found LMX quality to be positively related to employee satisfaction with communication (Mueller & Lee, 2002), and negatively related to levels of dominance adopted by supervisors when communicating with employees (Fairhurst, Rogers & Sarr, 1987). In high-quality LMX relationships supervisors tend to adopt a more positive tone (Dienesch & Liden, 1986), using communication behaviours which reinforce affect and relationship building (Fairhurst, 1993). In low-quality LMX relationships supervisors are more likely to use positional power and authority (Fairhurst & Chandler, 1989), and are more likely to be antagonistic and adversarial (Fairhurst, 1993). In low-quality LMX relationships communication tends to be downwards and unidirectional (Graen & Uhl-Bien, 1995), with little attempt to motivate the employee.

Research by Liden and Maslach (1988) found that unpleasant supervisor contact was a source of stress for the individual and was important in the development of emotional exhaustion. Baker and Ganster (1985) found that the extent to which a supervisor is perceived by an individual as open, friendly, calm, relaxed and attentive results in higher levels of employee satisfaction. Also, Fenlason and Beehr (1994) found that positive communication with the supervisor can lead to a buffering effect on the stress-strain relationship, whilst negative communication will lead to a reverse buffering effect. As it is more likely that individuals in high-quality LMX relationships will experience more positive communication and contact with their supervisors than those in low-quality LMX relationships who are more likely to experience unpleasant communication, the relationship between communication frequency and the components of burnout will be dependent on the quality of the LMX relationship. The following hypothesis is therefore proposed for investigation:

Hypothesis 16 *Communication frequency is only significantly related to burnout and its components when the quality of LMX is controlled for.*

Ray (1987) observes that the relationship between social support and employee well-being is not straightforward. Even when the relationship with the supervisor is positive due to the power inherent in the supervisor's role, interactions may have risks for the individual. Individuals who have high levels of uncertainty and regularly communicate this to their manager are likely to be considered unfavourably (Ray, 1987). Albrecht and Adelman (1987c) comment that the need for support to reduce uncertainty can be a two-edged sword: while there can be benefits to the interaction, there can also be high costs. They identify issues of impression management, identity management, incurred relational costs and difficulties in balancing incompatible relationships. For example, if there are strong norms for behaviour, individuals may feel that it is necessary to respond as expected in the interaction and mask their true feelings. If, in the interaction, the other party expresses an adverse opinion of the individual, such as a comment on a weakness, then this may reduce the individual's self-esteem and perceptions of personal control. If the interaction itself is uncertain or there is even a slight concern that the other's reaction may be negative, then the individual may become stressed about the interaction itself (Albrecht & Adelman, 1987c).

While more communication is expected to be positive, in that it will reduce uncertainty and hence employees' stress levels, other research has produced findings which challenge this view. Research by Kramer et al. (2004), found that rather than respond as predicted by Uncertainty Reduction Theory (URT) (Berger & Calabrese, 1975) to seek more information, some individuals used cognitive processes to reduce uncertainty. They also found that, in some individuals, while uncertainty was reduced

through communication, this did not lead to more positive attitudes in employees or to a reduction in their stress levels. It is also possible that new information can increase uncertainty if it is not compatible with prior knowledge (Planalp & Honeycutt, 1985). For example, in personal relationships uncertainty would be increased if competing relationships or deceptions are discovered, changes in personality or values are noticed or betrayals or failures are revealed. Research by Planalp and Honeycutt (1985) found that individuals had little trouble recalling communication interactions that increased uncertainty in interpersonal relationships. In a replication study (Planalp et al., 1988), this finding was confirmed. This study also found that there were negative relational consequences from the majority of the uncertainty-increasing incidents.

As previously mentioned in the introduction to this chapter, another way that an interaction with their manager may have detrimental effects on an employee is if their manager exhibits transformational leadership behaviour and encourages the employee to find innovative ways to achieve improved performance through intellectual stimulation (Seltzer, et al., 1989; Podsakoff et al., 1996) communicating high expectations for performance to the employee (Podsakoff et al., 1990; Podsakoff et al., 1996). Podsakoff et al. (1990: 135) state that: “although intellectual stimulation may produce desirable effects in the long run, it may be that in the short run, leaders who continually urge or exhort followers to search for new and better methods of doing things create ambiguity, conflict, or other forms of stress in the mind of the followers.” As transformational leadership behaviour (which has intellectual stimulation and communication of high expectations as two of its components) and LMX are highly correlated (Piccolo & Colquitt, 2006; Wang et al., 2005) and high-quality LMX relationships are associated with transformational leadership behaviour (Maslyn & Uhl-Bien, 2001) it follows that employee stress may increase as communication frequency increases in high-LMX relationships. It may be that the relationship between communication frequency and burnout is not linear. Hence, the following hypotheses are proposed for investigation:

- Hypothesis 17*** *The relationship between communication frequency and emotional exhaustion is curvilinear.*
- Hypothesis 18*** *The relationship between communication frequency and depersonalization is curvilinear.*
- Hypothesis 19*** *The relationship between communication frequency and reduced personal accomplishment is curvilinear.*
- Hypothesis 20*** *The relationship between communication frequency and burnout is curvilinear.*

4.2.3 LMX and Occupational Self-Efficacy

Self-efficacy (Bandura, 1986; 1989) (see section 2.2) is a construct derived from sociocognitive theory. It refers to “beliefs in one’s capabilities to organize and execute

courses of action required to manage prospective situations” (Bandura, 1995: 2). An individual’s perception of their self-efficacy varies across different activities and tasks (Bandura, 1986), and a distinction must be made between self-efficacy as a general stable trait and a situation-specific state (Eden & Kinnar, 1991). Occupational self-efficacy can be defined as “one’s belief in one’s own ability and competence to perform successfully and effectively in situations and across different tasks in a job” (Schyns et al., 2005: 3). An individual’s judgment of their self-efficacy is based on four sources of information: previous performance and achievement, vicarious experience of observing the performance of others, verbal and other forms of social persuasion from which people judge their capabilities, and their psychological state (Bandura, 1986). Of these previous performance and achievement is the most influential in affecting an individual’s self-efficacy perceptions (Bandura, 1995).

Conger and Kanungo (1988: 473) propose that individuals are empowered when “they believe they can adequately cope with events, situations, and/or the people they confront.” Conger and Kanungo (1988) posit a relational dynamic where managers share power with subordinates and empower them through delegation of authority, involvement in decision making and giving them control over internal resources. High-quality LMX relationships are characterized by leaders providing higher levels of resources (Graen & Uhl-Bien, 1995) and key opportunities (Sparrowe & Liden, 1997) to the employee. LMX has been found to be positively related to levels of job involvement (Greguras & Ford, 2006), autonomy (Schriesheim et al., 1998), participation in decision making (Nelson et al., 1988) and delegation by the supervisor (Schriesheim et al., 1998). Individuals in high-quality LMX relationships, will therefore, be provided with more opportunities to develop and demonstrate their expertise, and will have more resources available to help them succeed in these opportunities. It follows that they will have greater opportunities to test and enhance their efficacy through increased mastery experiences if they are in high-quality LMX relationships rather than low-quality LMX relationships, where they will be required to do little more than what is in their job description, with their manager making little effort to motivate or support them (Graen & Uhl-Bien, 1995). Prior research has found that employee levels of empowerment are enhanced when individuals receive support from their supervisors and have increased negotiating latitude through a mechanism of a perception of increased control (Keller & Dansereau, 1995). Also, LMX quality is positively related to a mastery goal orientation of focusing on acquiring competence (Chiaburu, 2005) and to psychological empowerment in employees (Aryee & Chen, 2006). Further, Gist and Mitchell (1992) in their model of the self-efficacy-performance relationship, suggest that an individual’s assessment of situational resources and constraint is an important factor in the development of an individual’s judgment of self-efficacy. As individuals in high-quality LMX relationships will have high levels of tangible and intangible resources available to them, this will have a positive impact on their self-efficacy perceptions. The positive

spiral where an individual has high-self expectations that lead to high performance, which increase mastery experience leading to higher self-efficacy, is known as the *Galatea effect* (see, for example, Eden & Zuk, 1995; McNatt & Judge, 2004).

Dienesch and Liden (1986) suggest that there are three dimensions to the LMX relationship: *perceived contribution*, *loyalty* and *affect*. They argue that the *perceived contribution* by each party of the quality and effort invested by the other person and their level of achievement of the shared goals has the largest effect. Liden and Maslyn (1998) added a fourth dimension of *professional respect* to these three dimensions. Graen and Uhl-Bien (1995) argue that the LMX relationship is based on the perceptions of the working relationship, professional capabilities and behaviours. They posit that there are three dimensions to LMX of: *mutual respect*, *respect for the capabilities* of the other and *obligation*. It follows that in a high-quality LMX relationship, the manager invests resources in an employee that they judge to have high levels of professional ability and capabilities, with an expectation of a return in terms of the employee being obligated to provide loyalty and a high investment of effort to achieve the shared goals. Related to the *Galatea effect* is the *Pygmalion effect*. This is where the high expectations of one individual lead to the other performing at a higher level (see, for example, Eden & Shani, 1982; McNatt & Judge, 2004). Eden and Kinnar (1990: 147) state that “expecting much of his or her subordinates and conveying high performance expectations to them via myriad channels, the manager-as-Pygmalion acts in ways that boost subordinates' sense of self-efficacy. Expecting to do well motivates greater effort and culminates in improved performance.” Further, self-efficacy positively influences individuals' choices of goals, levels of effort expended and persistence levels. Individuals with low self-efficacy develop doubts and easily give up, whereas high self-efficacy increases efforts to overcome obstacles, such perseverance usually producing the desired result (Maddux, 1995). As investment of effort by the employee is a key factor in the formation of a high-quality LMX relationship and achievement of the shared goals is a key component of the LMX relationship (Dienesch & Liden, 1986), it again follows that the relationship between occupational self-efficacy and LMX will be positive.

Prior research has supported a positive relationship between LMX and self-efficacy. In a longitudinal study of interns in the United States, Murphy and Ensher (1999) found a positive relationship between self-efficacy and LMX quality with their supervisor. They also found that interns who were initially low in self-efficacy experienced an increase after seven weeks when LMX was high, while those in low-quality relationships did not experience an increase. In studies of German workers, Schyns and von Collani (2002) and Schyns et al. (2005) found LMX to be positively correlated to occupational self-efficacy ($r = .17, p < .01$ and $r = .19, p < .001$, respectively). Therefore, it is expected that the employee perception of the quality of the LMX with the supervisor will be positively related to the level of employee occupational self-efficacy. Thus, the following hypothesis is proposed for investigation:

Hypothesis 21 *The quality of the LMX relationship is positively related to occupational self-efficacy.*

4.2.4 Communication Frequency and Occupational Self-Efficacy

As mentioned above, Bandura (1986) posits that individual's self-efficacy judgments are influenced by verbal and other forms of social persuasion. Although verbal persuasion is regarded as a less potent source of enduring self-efficacy (Maddux, 1995), in many situations and in particular when task performance is ambiguous or achievement is ill defined and socially judged, individuals perceptions of their performance and achievement will be influenced by feedback from others (Bandura, 1986). Managers are a frequent source of performance feedback for individuals (Andrews & Kacmar, 2001). Managers use feedback and encouragement in an attempt to empower subordinates (Conger, 1986; cited in Conger & Kanungo, 1988: 479). Ashford and Tsui (1991) argue that active feedback seeking by an individual is a central part of the process of self-regulation to achieve effectiveness in the work place. Barner-Rasmussen (2003: 42) propose the following benefits of seeking feedback for an individual: "(a) more accurate signals with regard to goal prioritization; (b) reduced uncertainty with regard to issues surrounding goal attainment; and (c) a better basis for improving his/her own competence." Prior research has confirmed the positive relationship between feedback seeking and an individual's ability to evaluate their competence and performance (Morrison, 1993; Renn & Fedor, 2001).

Research by Bandura and Cervone (1986) demonstrated the influence of feedback on self-efficacy. Also, in an experimental augmentation of self-efficacy Eden and Zuk (1995) reduced levels of sea sickness experienced by sea cadets through a combination of verbal persuasion (telling the cadets that they were unlikely to experience sea sickness) and vicarious experience (screening video clips of crews performing in rough seas).

A critical factor for verbal or other forms of social persuasion to have influence on an individual's perception of their self-efficacy is the credibility, trustworthiness, and expertise of the person involved in providing the feedback and doing the persuading (Bandura, 1976; Bandura, 1986; Gist & Mitchell, 1992). As previously mentioned (see section 4.2.2), key dimensions of LMX relationships include *mutual respect*, *respect for the capabilities of the other* (Graen & Uhl-Bien, 1995) and *professional respect* (Liden & Maslyn, 1998). Research by Parker (1998) found that an increase in work place communication predicted the development of greater self-efficacy, but speculated that the importance of communication lies not so much in the frequency of information dissemination, but the extent to which employees feel listened to and encouraged to put forward their views (i.e., the degree of two-way communication). LMX theory suggest that intra-dyadic communication is essential for LMX development (Graen & Uhl-Bien, 1995). Also as previously mentioned, communication by managers in high-quality LMX

relationships tends to be less adversarial and antagonistic (Fairhurst, 1993), less dominating (Fairhurst et al., 1987), more positive in tone (Dienesch & Liden, 1986), and more cooperative (Lee, 2001). Thus, it is suggested that the quality of the LMX relationship is a critical factor in the effect of communication frequency on occupational self-efficacy. Therefore, the following hypotheses are proposed for investigation:

Hypothesis 22 *Communication frequency is positively related to occupational self-efficacy.*

Hypothesis 23 *The relationship between communication frequency and occupational self-efficacy is mediated by the LMX relationship.*

4.3 ANALYSIS AND RESULTS

4.3.1 Initial Analysis

All scales used in the analysis were found to have adequate reliability with Cronbach's alphas above $\alpha = .70$ (emotional exhaustion $\alpha = .88$; depersonalization $\alpha = .74$; reduced personal accomplishment $\alpha = .88$; unidimensional burnout measure $\alpha = .86$; occupational self-efficacy $\alpha = .89$; LMX $\alpha = .93$; and communication frequency $\alpha = .87$, see table 3.1). Descriptive statistics for the variables are shown in table 3.17. Only the unidimensional measure of burnout was found to be normally distributed (see section 3.3.7). Nonlinear transformations (see section 3.3.7) were used as appropriate to check for the nonnormality of distribution of variables on the results of analyses.

To check if common-method variance (Podsakoff & Organ, 1986) was a problem (see section 3.4) a Harmon One-Factor test (Podsakoff et al., 2003) was conducted. For each analysis the relevant items for the scales were loaded into a confirmatory factor analysis, and the unrotated factor solution was examined. For the emotional exhaustion, depersonalization, reduced personal accomplishment, unidimensional burnout measure and occupational self-efficacy analyses, the first factor extracted accounted for 32.2%, 37.9%, 32.8%, 23.1% and 28.4%, respectively. As no single factor emerged from the factor analyses and one general factor was not found for the majority of the covariance in the independent and dependent variables, it is indicated that common-method variance is not a pervasive problem in these analyses.

Further, for each analysis a confirmatory factor analysis was conducted to check whether the items loaded cleanly onto their respective factors. A nonorthogonal rotation method of Oblique rotation was used. In Oblique rotation the pattern matrix is used for interpretation purposes (Hair et al., 2006: 153; Tabachnick & Fidell, 2007: 625). These are shown in tables A-4.1, A-4.2, A-4.3 and A-4.4 (see appendix 4.1). For clarity and because factor loadings above $\pm .30$ to $\pm .40$ are considered as the minimum acceptable (Hair et al., 2006: 129), only factor loadings above .35 are shown. Hair et al. (2006: 128) state that only factor loadings of .50 and above are significant for a sample of 120 at a significance of $p < .05$, which decreases to .45 as the sample size increases to

150. For these reasons only values above .49 are considered as significant in this analysis. As can be seen in the tables, the relevant items loaded cleanly onto their respective factors.

Bivariate correlations for the variables are shown in table 4.1. As expected, the three components of burnout of emotional exhaustion, depersonalization and reduced personal accomplishment were found to be highly correlated to the total measure of burnout ($r = .748, p = .000$; $r = .541, p = .000$; and $r = .747, p = .000$, respectively). Consistent with the meta-analytical findings of Lee and Ashforth (1996), emotional exhaustion was more strongly correlated to depersonalization ($r = .329, p = .000$) than to reduced personal accomplishment ($r = .148, p = .100$). The unidimensional measure of burnout and each of the components were found to be negatively correlated to occupational self-efficacy (unidimensional of burnout: $r = -.483, p = .000$, emotional exhaustion: $r = -.345, p = .000$; depersonalization: $r = -.251, p = .005$, and reduced personal accomplishment: $r = -.380, p = .000$).

As expected, LMX and communication frequency were positively correlated ($r = .436, p = .000$). As predicted, LMX was negatively correlated to emotional exhaustion ($r = -.224, p = .012$), depersonalization ($r = -.280, p = .002$), reduced personal accomplishment ($r = -.169, p = .061$) and the unidimensional of burnout ($r = -.287, p = .001$), and positively correlated to occupational self-efficacy ($r = .268, p = .002$). Communication frequency was not found to be correlated to any of the dimensions of burnout or the unidimensional burnout measure but, as predicted, was positively correlated to occupational self-efficacy ($r = .241, p = .006$). Job demand was not found to be correlated to any of the components of burnout, but was found to correlate to the unidimensional measure of burnout ($r = .159, p = .078$). Of the control variables, gender was not found to correlate with any of the variables and tenure was found to correlate positively with depersonalization ($r = .179, p = .047$).

The maximum correlation between independent variables included in the analyses was .44 (see table 4.1) which is less than the upper limit of .70 recommended by Tabachnick and Fidell (2001: 84) for the reduction of the risk of multicollinearity. As discussed in chapter 3 (section 3.3.9), independent variables were mean-centered before being entered into the regression equations.

4.3.2 Analysis for Dependent Variable Emotional Exhaustion

Emotional exhaustion was found to be nonnormal (see section 3.3.7). Because skewness in the dependent variable can be a source of skewness in the residuals (Cohen et al., 2003: 246) the initial analysis was conducted with the transformed dependent variable $EE^+ = \text{SQRT}(EE)$, (see section 3.3.7). Analysis 4.1 was the initial analysis for the dependent variable EE^+ and the independent variables: gender, tenure, JD, LMX and CF. Analysis 4.2 investigated whether the findings were substantially changed by

TABLE 4.1 Bivariate Correlations for Gender, Tenure, Job Demand, LMX, CF, EE, DEP, rPA, MBI and OCCSEFF

Variable	1	2	3	4	5	6	7	8	9
1. Gender	-								
2. Tenure	.112	-							
3. Job Demand (JD)	-.020	-.019	-						
4. Leader-Member Exchange (LMX)	.023	-.062	.098	-					
5. Communication Frequency (CF)	-.023	-.022	.011	.436***	-				
6. Emotional Exhaustion (EE)	.058	-.008	.126	-.224*	-.001	-			
7. Depersonalization (DEP)	.075	.179*	.085	-.280**	-.001	.329***	-		
8. reduced Personal Accomplishment (rPA)	-.091	.023	.112	-.169 [†]	-.049	.148	.275**	-	
9. Burnout (MBI)	.008	.040	.159 [†]	-.287**	-.031	.748***	.541***	.747***	-
10. Occupational Self-Efficacy (OCCSEFF)	-.040	.055	-.050	.268**	.241**	-.345***	-.251**	-.380**	-.483***

Tests of significance were two-tailed. $n = 128$. [†] $p < .1$, * $p < .05$, ** $p < .01$; and *** $p < .001$.

deletion of a small number of cases identified as potential outliers. In analysis 4.3, the effect of the nonnormality of independent variables on the results of analysis 4.1 was confirmed. In analysis 4.4, post hoc probing of the relationships found between emotional exhaustion, communication frequency and LMX was conducted. In analysis 4.5, the analysis was repeated for the untransformed dependent variable emotional exhaustion, and the results were compared to those found in the previous analyses.

Analysis 4.1

The variables gender, tenure and job demand were entered into the equation in model 1⁺. To test Hypothesis 1, the linear LMX term was then added to give model 2⁺. To confirm whether the relationship between LMX and emotional exhaustion was curvilinear, to test Hypothesis 5, the quadratic LMX² term (see section 3.3.2) was added to this model to give model 3⁺. Hypothesis 12 was then tested by adding the linear CF term to model 2⁺ to give model 4⁺. To test Hypothesis 17 and to investigate whether the relationship between communication frequency and emotional exhaustion was curvilinear the quadratic CF² term was added to give model 5⁺. To test whether there was a significant interaction effect between LMX and communication frequency, to test Hypothesis 8, product terms for LMX × CF and LMX × CF² were added in models 6⁺ and 7⁺. The results are shown in tables 4.2 and 4.3.

In model 1⁺ none of the variables were found to be significantly related to the transformed variable EE⁺. The addition of the linear LMX term to model 1⁺ to give model 2⁺ resulted in a significant *F* change of $p = .005$. The unstandardized coefficient for the linear LMX term was significant and had a value of $B = -.042$, $p = .005$. In model 3⁺ the unstandardized coefficient for the quadratic LMX term was not significant ($p = .969$) and the adjusted R^2 reduced from .047 to .039. These results indicate that the relationship between LMX and emotional exhaustion is linear and negative. Hypothesis 1 is supported and Hypothesis 5 rejected. The increase in the squared partial correlation R^2 of .065 indicates a small to moderate effect size (Cohen et al., 2003: 212). The addition of the linear CF term to give model 4⁺ did not result in a significant *F* change ($p = .278$) and the coefficient was nonsignificant ($p = .278$). The addition of the quadratic communication frequency term CF² to the equation in model 5⁺ resulted in a significant *F* change of $p = .030$. The increase in the squared partial correlation R^2 was .041, and the coefficients for the unstandardized coefficients for CF and CF² were $B = .080$, $p = .032$ and $B = -.013$, $p = .030$, respectively. It should be noted that the linear and quadratic terms for communication frequency, CF and CF², were not found to be significant ($p = .523$ and $p = .129$, respectively) unless the LMX term was added to the equation. This provides support for Hypothesis 16. These results indicate that the relationship between communication frequency and emotional exhaustion is curvilinear, with a predominantly positive, concave downward-sloping curve, but only when the effect of the LMX relationship is controlled for. The unstandardized coefficient for LMX increased from B

= -.042, $p = .005$, in model 2⁺ to $B = -.057$, $p = .001$ in model 5⁺, confirming the negative relationship between LMX and emotional exhaustion.

TABLE 4.2 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE⁺) and Independent Variables Gender, Tenure and Mean-Centered JD and LMX

Variable	Model 1 ⁺	Model 2 ⁺	Model 3 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	3.692*** (.113)	3.701*** (.110)	3.698*** (.139)
Gender	-.255 (.320)	-.283 (.311)	-.284 (.313)
Tenure	-.098 (.356)	-.162 (.347)	-.162 (.349)
Job Demand	.007 (.007)	.009 (.007)	.009 (.007)
LMX		-.042** (.015)	-.042* (.017)
LMX ²			.000 (.002)
<i>F</i> value	.568	2.501*	1.984 [†]
Sig. <i>F</i> Change	.637	.005	.969
<i>R</i> ²	.014	.078	.078

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable $EE^+ = \text{SQRT}(EE)$.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

In model 6⁺ the unstandardized coefficients for the product term $LMX \times CF$ was added to the equation. The coefficient was found to be nonsignificant ($p = .624$). In model 7⁺ the $LMX \times CF^2$ term was added. The coefficient had a significance of $p = .012$. Cohen et al. (2003: 211) state that when considering whether to include higher-order terms there are no hard rules. To decide between two equations of adjacent order, one of the following criteria may be employed:

TABLE 4.3 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, LMX and CF

Variable	Model 1 ⁺	Model 2 ⁺	Model 4 ⁺	Model 5 ⁺	Model 6 ⁺	Model 7 ⁺
	<i>B</i> (<i>s.e.</i>)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)
Constant	3.692*** (.113)	3.701*** (.110)	3.703*** (.110)	3.873*** (.133)	3.872*** (.133)	3.793*** (.134)
Gender	-0.255 (.320)	-0.283 (.311)	-0.296 (.311)	-0.321 (.306)	-0.309 (.308)	-0.401 (.303)
Tenure	-0.098 (.356)	-0.162 (.347)	-0.165 (.347)	-0.180 (.341)	-0.187 (.343)	-0.004 (.342)
Job Demand	.007 (.007)	.009 (.007)	.009 (.007)	.008 (.007)	.009 (.007)	.011 [†] (.007)
LMX		-.042** (.015)	-.050** (.016)	-.057** (.016)	-.054** (.017)	-.021 (.017)
CF			.033 (.031)	.080* (.037)	.081* (.037)	.112** (.038)
CF ²				-.013* (.006)	-.015* (.007)	-.010 (.007)
LMX x CF					.003 (.005)	.006 (.005)
LMX x CF ²						-.002* (.001)
<i>F</i> value	.568	2.501*	2.242 [†]	2.736*	2.365*	2.973**
Sig. <i>F</i> Change	.637	.005	.278	.030	.624	.012
<i>R</i> ²	.014	.078	.087	.124	.126	.173
Δ Adjusted <i>R</i> ²	-0.011	.058	.001	.031	-0.006	.042

Notes: *n* = 128; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable EE⁺ = SQRT (EE).

[†] *p* < .1; * *p* < .05; ** *p* < .01; and *** *p* < .001.

1. the loss (or gain) in prediction attributed to the highest-order term employing some conventional level of significance. The significance of the *F* change between models 6⁺ and 7⁺ was *p* = .012.

2. changes in squared partial correlations of .020, .130, and .260 are reflective of small, moderate, and large effect sizes (Cohen et al., 2003: 212). The introduction of the interaction term LMX x CF² to model 6⁺ resulted in an increase in the squared partial correlation of .054.
3. the change in the *adjusted R*². A reasonable criterion for deciding between two equations is when the *adjusted R*² change is between .020 and .050. The *adjusted R*² change between the two models was .042, which is above the lower limit suggested.

As all three criteria suggested by Cohen et al. (2003: 211) are met, it is concluded that the curvilinear relationship between communication frequency and emotional exhaustion is moderated by the quality of the LMX relationship. Hypothesis 8 is supported. As a further check the product terms were entered in a single step to model 5⁺. All three criteria were again met. The significance of the *F* change was .039, the increase in the squared partial correlation was .056 and the *adjusted R*² change was .036.

Model 7⁺ had an *F* value of 2.973, *p* = .005. It should be noted that, although the coefficient for the LMX × CF term was not significant in the model, it would be a misspecification of the regression model to omit this term as higher-order terms only represent the effects they are intended to when the lower-order terms are partialled out (Aiken & West, 1991: 110; Brambor et al., 2006; Cohen et al., 2003: 284, 293). Gender and tenure were not found to be significantly related to emotional exhaustion in any of the models. Although it was not found to be significant in models 1⁺ to 6⁺, in model 7⁺, the unstandardized coefficient for the JD term was significant with *B* = .011, *p* = .097. Although not shown, the addition of the product term LMX × JD to model 4⁺ to test Hypothesis 6 and the moderation of the relationship between job demand and emotional exhaustion by LMX resulted in a nonsignificant coefficient (*p* = .403).

No violation of assumptions was indicated from inspection of the probability plot and scatterplot of regression standardized residuals for each of the models in the analysis (see figures A-4.1 and A-4.2, respectively, in appendix 4.2). The maximum value for the Variance Inflation Factor (VIF) was 3.24, indicating that multicollinearity was not a major issue. The previously conducted examination of *z* scores for each variable (see section 3.3.6) had not identified any potential outliers for the variables of EE⁺, LMX and CF. The maximum value found was 2.80, which is well below the value of ± 3.29 (for a sample size less than 1000 and a criterion of *p* = .001) specified by Tabachnick and Fidell (2007: 128). In models 2⁺ to 7⁺ the maximum values of standardized residuals and Cook's distance were 2.81 and .105, respectively, indicating that outliers had not adversely influenced the results. Further, the maximum value of *DFBETA* observed was -.012 which is well below the limit of ± 1.0 (see section 3.3.6), indicating that no case had undue influence on any of the regression coefficients in the equation. However, Hair et al. (2006: 222) advise that the researcher needs to be aware of instances where results would be substantially changed by deletion of a single or small number of cases. To

confirm if this was true for this analysis, the analysis was repeated with five cases (1, 23, 39, 40, and 51) that had Mahalanobis distances above the critical value of 25.74 (see section 3.3.6) removed. The results are presented in analysis 4.2 below.

Analysis 4.2

With the five cases removed the unstandardized coefficients for the product term LMX x CF² was still found to be significant ($B = -.003$, $p = .076$) as was the F change between the models ($p = .076$). The value of the squared partial correlation R^2 was .28, indicating a small effect size. The *adjusted* R^2 change between the two models declined to .019 which is slightly below the lower limit suggested of .020 (Cohen et al., 2003: 211). The final model had an F value of 2.254, $p = .029$. This suggests that the finding of the curvilinear-linear interaction is not dependent on a small number of cases.

Analysis 4.3

The variables Job Demand, LMX and CF were found to be nonnormal in their distributions (see section 3.3.7). To check as far as possible that the results were not adversely influenced by the nonnormality of these variables, the analysis was repeated for the transformed dependent variable EE^+ with transformed independent variables $JD^+ = \text{LOG}(JD)$ and $LMX^+ = \text{SQRT}(k - LMX)$. The variable CF was not transformed, as a non-linear transformation of this variable would have removed the curvilinear effect proposed. As can be seen from table A-4.5 the results are not materially different from those of analysis 4.1 shown in table 4.3. The F values and adjusted R^2 for each corresponding model were almost identical to the previous analysis, as were the significance of the F changes between adjacent models. Once the effects of the transformations were considered the sign of the unstandardized coefficients were consistent with the previous analysis. In model 5⁺⁺ the significance of the coefficients for the CF and CF² terms declined slightly from $p = .032$ and .030, previously, to .050 and .055, respectively. There was no material change in the significance of the coefficient for the LMX term. The moderation of the curvilinear communication frequency and emotional exhaustion relationship by the linear LMX term was confirmed. The adjusted R^2 between models 6⁺⁺ and 7⁺⁺ increased from .063 to .110 and the significance of the unstandardized coefficients also increased, from that previously in model 7⁺⁺, for both the $CF \times LMX^+$ and the $CF^2 \times LMX^+$ product terms ($p = .251$ to .119 and $p = .012$ to .009, respectively). The change in the squared partial correlation R^2 increased for model 7⁺⁺ to a value of .058, which compares to .054, previously. In model 7⁺⁺ the unstandardized coefficient for the transformed job demand term, JD^+ , was not found to be significant ($p = .119$).

No violation of assumptions was indicated from inspection of the P-P plot and scatterplot of regression standardized residuals. The maximum value for the Variance Inflation Factor (VIF) in the analysis was 3.63, indicating that multicollinearity was not

a major issue. The maximum Cook's distance and value of $DFBETA$ in this analysis were .097 and .083, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients. These results suggest that the findings were not materially influenced by the nonnormality of the dependent variables job demand and LMX.

Analysis 4.4

Further to the evidence presented above, there is strong theory to predict an interaction effect between LMX and the curvilinear relationship between communication frequency and burnout. Aiken and West (1991: 105) advise that "where there are strong theoretical grounds for expecting an interaction, the interaction, even if non-significant, should be retained in the final regression equation" and suggest that post hoc probing procedures are used as a guide to understand how the interaction modifies the results. The equation for model 7⁺ is:

$$EE^+ = B_1 \times CF + B_2 \times CF^2 + B_3 \times LMX + B_4 \times CF \times LMX + B_5 \times CF^2 \times LMX + B_6 \times \text{Gender} + B_7 \times \text{Tenure} + B_8 \times \text{JD} + B_0$$

The value of CF where the maximum / minimum of this equation is given by (Aiken & West, 1991: 86):

$$= \frac{-(B_1 + B_4 \times LMX)}{2 \times (B_2 + B_5 \times LMX)} \quad (\text{Equation 4.1})$$

The simple slope of EE^+ on CF for the equation is given by (Aiken & West, 1991: 64):

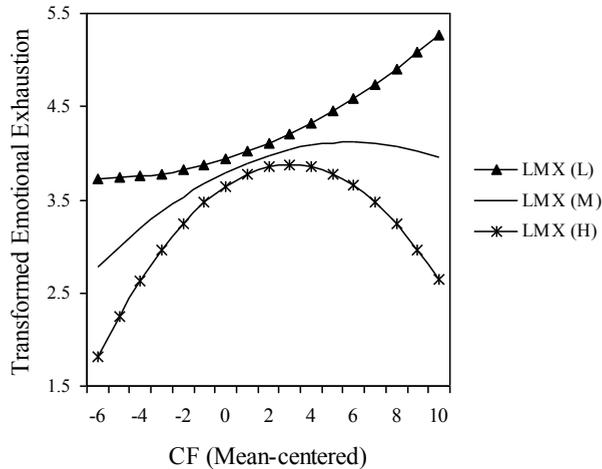
$$(B_1 + 2B_2 \times CF + B_4 \times LMX + 2B_5 \times LMX \times CF) \quad (\text{Equation 4.2})$$

Substituting the relevant coefficient values from model 7⁺ and values for CF_M , CF_L , CF_H , LMX_M , LMX_L , and LMX_H (corresponding to values of the mean and at ± 1.0 standard deviation) gives the nine simple slopes for the equation for transformed emotional exhaustion. The results are shown in table 4.4 and the plot in figure 4.1.

TABLE 4.4 Simple Slopes for the Equation for Curvilinear CF and Transformed Emotional Exhaustion (EE^+) Relationship, Linear LMX Relationship and a Curvilinear CF by Linear LMX Interaction

	$CF_L = -3.59$	$CF_M = 0$	$CF_H = 3.59$
$LMX_L = -6.73$	.027	.071	.116
$LMX_M = 0$	.181	.112	.043
$LMX_H = 6.73$	.334	.153	-.029

FIGURE 4.1 Interaction between Communication Frequency and LMX predicting Transformed Emotional Exhaustion



Analysis 4.5

Analysis 4.1 was repeated for the untransformed dependent variable emotional exhaustion. The results were consistent with those of the previous analysis and are shown in table 4.5. The maximum value for the Variance Inflation Factor (VIF) in the analysis was 3.24, indicating multicollinearity was not a major issue. The maximum Cook's distance and value of *DFBETA* in this analysis were .156 and .105, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients.

The simple slope values for this equation were again calculated for values for CF_M , CF_L , CF_H , LMX_M , LMX_L , and LMX_H (corresponding to values of the mean and at ± 1.0 standard deviation). The results are shown in table 4.6 and are consistent with those calculated previously for model 7⁺ (transformed dependent variable EE^+ , see table 4.4). The reader is referred to section 4.4.2 and figures 4.11 and 4.12 in the discussion section of this chapter for the plot of the interactions between LMX and communication frequency predicting emotional exhaustion.

TABLE 4.5 Regression Analysis for Dependent Variable Emotional Exhaustion and Independent Variables Gender, Tenure and Mean-Centered JD, LMX and CF

Variable	Model 1	Model 2	Model 4	Model 5	Model 6	Model 7
	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	<i>B</i> (<i>s.e.</i>)
Constant	14.812*** (.868)	14.877*** (.846)	14.894*** (.844)	16.076*** (1.023)	16.060*** (1.023)	15.454*** (1.027)
Gender	-1.659 (2.456)	-1.867 (2.394)	-1.986 (2.388)	-2.161 (2.360)	-1.974 (2.368)	-2.684 (2.329)
Tenure	-.387 (2.733)	-.852 (2.668)	-.884 (2.660)	-.986 (2.628)	-1.094 (2.630)	.322 (2.627)
Job Demand	.075 (.054)	.089 [†] (.053)	.092 [†] (.053)	.085 (.052)	.091 [†] (.052)	.110* (.052)
LMX		-.309** (.114)	-.381** (.126)	-.427** (.126)	-.388** (.132)	-.135 (.163)
CF			.306 (.234)	.631* (.283)	.656* (.284)	.897** (.293)
CF ²				-.090* (.045)	-.122* (.056)	-.080 (.057)
LMX x CF					-.040 (.040)	.067 [†] (.040)
LMX x CF ²						-.018* (.012)
<i>F</i> value	.795	2.480*	2.338*	2.659*	2.422*	3.045**
Sig. <i>F</i> Change	.499	.007	.194	.049	.319	.012
<i>R</i> ²	.020	.078	.091	.121	.128	.176
Δ Adjusted <i>R</i> ²	-.005	.051	.006	.023	.000	.043

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 4.6 Simple Slopes for the Equation for Curvilinear CF and Emotional Exhaustion Relationship, Linear LMX Relationship and a Curvilinear CF by Linear LMX Interaction

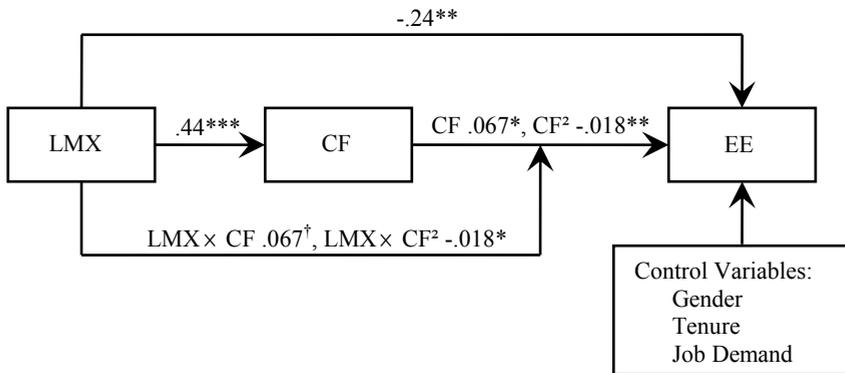
	CF _L = -3.59	CF _M = 0	CF _H = 3.59
LMX _L = -6.73	.148	.448	.748
LMX _M = 0	1.47	.897	.320
LMX _H = 6.73	2.79	1.35	-.108

4.3.3 Summary of Results for Dependent Variable Emotional Exhaustion

The quality of employees' LMX relationship with their manager is linear and negatively related to their level of emotional exhaustion. The increase of the squared partial correlation R^2 was .059, indicating a small effect size. Hypothesis 1 is supported and Hypothesis 5 rejected. The relationship between employees' communication frequency with their manager and their levels of emotional exhaustion is found to be the opposite to that predicted, and is found to be related with a predominantly positive, concave downward-sloping curve, but only when LMX is controlled for. Hypothesis 12 is rejected and Hypothesis 16 is supported. The increase of the squared partial correlation R^2 was .047 for the linear and curvilinear communication frequency terms indicating a small effect size. The curvilinear relationship was found to be moderated by the quality of the LMX relationship with the manager. The increase of the squared partial correlation R^2 was .039 for the moderation effect indicating that an additional 3.9% of variance was explained by the interaction effect between communication frequency and LMX predicting emotional exhaustion. Job demand was found to be positively related to emotional exhaustion, but only when LMX was controlled for. The increase of the squared partial correlation R^2 was .024, indicating a small effect size.

Neither of the control variables of gender or tenure were significantly related to emotional exhaustion. To allow the comparison of effects of variables on the dependent variable across studies it is recommended that the standardized coefficient (β) is reported (Cohen et al., 2003: 154). For interaction terms however, unstandardized coefficients (B) are reported as standardized coefficients for interaction terms are not properly standardized and are therefore uninterpretable (Aiken & West, 1991; Frazier, Tix & Barron, 2004) and may lead to misinterpretation of the results (Jaccard & Turrissi, 2003: 68). The results are summarized in figures 4.2 and 4.3.

FIGURE 4.2 Relationships between LMX, Communication Frequency and Emotional Exhaustion

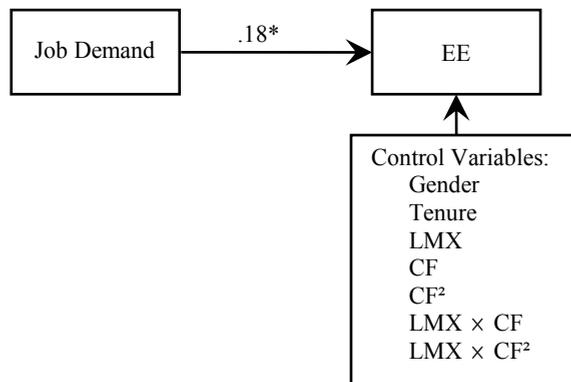


Notes: Standardized coefficients are shown; except for interaction terms where unstandardized coefficients are shown to prevent misinterpretation of the results.

The curvilinear relationship between CF and EE is only significant when LMX is controlled for.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 4.3 Relationship between Job Demand and Emotional Exhaustion



Notes: Standardized coefficient is shown,

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

4.3.4 Analyses for Dependent Variable Depersonalization

Depersonalization was found to be nonnormal, and a successful transformation to normalize the scores was not found (see section 3.3.7). In analysis 4.6 the regression analysis was conducted for the original depersonalization scores. In analysis 4.7, analysis 4.6 was repeated with an identified outlier removed. In analysis 4.8, to minimize lack of normality and heteroscedasticity in the regression residuals, the analysis was conducted with the transformed independent variables $JD^+ = \text{LOG}(JD)$, $LMX^+ = \text{SQRT}(k - LMX)$ and $CF^+ = \text{LOG}(CF)$ (see section 3.3.7), and a technique described by Cohen et al. (2003: 238) was used of including a constructed variable (W_i) in the regression equation to predict a value of λ for use in a Box Cox transformation of $DEP^{(\lambda)}$. The outlier was removed from this analysis. In analysis 4.9 a non-parametric alternative to Pearson's product-moment correlation, a Spearman Rank Order Correlation, was conducted to calculate the strength of the relationship between the variables. In analysis 4.10 a logistic regression analysis was conducted having categorized the depersonalization scores into two categories of no report of depersonalization and some level of depersonalization.

Analysis 4.6

Model 8 was the base model with the variables gender, tenure and job demand included in the equation. In model 9 the LMX term was added to test for Hypothesis 2. In model 10 the CF term was added to the base model to test Hypothesis 13. The LMX term was then added to this model to give model 11 to confirm relationships with the dependent variable whilst controlling for each of the other independent variables.

The addition of the LMX term to the equation resulted in an F change with a significance of $p = .001$. The increase in the squared partial correlation R^2 of .083 indicates a small to moderate effect size. The unstandardized coefficient for the LMX term was $B = -.106$, $p = .001$. This suggests that the relationship between LMX and depersonalization is negative as predicted, which supports Hypothesis 2. The addition of the CF term to the base model resulted in a reduction of the adjusted R^2 value for the model, with the coefficient for the CF term being nonsignificant ($p = .972$). When the LMX term was added to model 10 to give model 11 the coefficient for the CF term was slightly above the limit of significance with $B = .110$, $p = .105$. The maximum value of $DFBETA$ in this analysis was 1.20 which is above the cut-off of 1.00 and suggests that a case had high influence. One case had previously been identified as a potential outlier for DEP with a z value of 5.26 (reference section 3.3.6). The regression was repeated with the case removed and the results reported in analysis 4.7.

Analysis 4.7

The maximum Cook's distance and value of $DFBETA$ in this analysis were .205 and .695, respectively, suggesting no case now had high influence on the overall equation or any of the individual coefficients. The results are shown in table 4.7.

TABLE 4.7 Regression Analysis for Dependent Variable Depersonalization (DEP) (With Outlier Removed) and Independent Variables Gender, Tenure and Mean-Centered JD, LMX and CF

Variable	Model 8	Model 9	Model 10	Model 11
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	1.640*** (.227)	1.660*** (.218)	1.640*** (.228)	1.668*** (.214)
Gender	-.437 (.642)	-.504 (.616)	-.443 (.645)	-.555 (.606)
Tenure	.340 (.749)	.219 (.718)	.339 (.751)	.175 (.707)
Job Demand	-.001 (.014)	.003 (.014)	-.002 (.014)	.004 (.014)
LMX		-.100** (.029)	-	-.130*** (.032)
CF			.026 (.057)	.132* (.060)
<i>F</i> value	.256	3.119*	.241	3.557**
Sig. <i>F</i> Change	.857	.001	.655	.000
<i>R</i> ²	.006	.096	.008	.133

Notes: $n = 127$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 10, the significance of the *F* change is from model 8.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As expected, inspection of the P-P plot showed a departure from normality of the distribution of the residuals (see figure A-4.3 in appendix 4.2) and a degree of violation of assumptions. Inspection of the scatterplot of regression standardized residuals (see figure A-4.4 in appendix 4.2) indicated a level of heteroscedasticity. Some caution is required when interpreting these results. The LMX relationship with depersonalization was not materially changed. Communication frequency was found to be positively related to depersonalization with an unstandardized coefficient for the CF term of $B = .132$, $p = .029$, once LMX was controlled for. The increase in the squared partial correlation R^2 of .041 indicates a small effect size. Although not shown, no support was found for Hypothesis 18; when the curvilinear CF^2 term was added to model 11 the coefficient for this term was found to be nonsignificant ($p = .110$) and the change in the

adjusted R^2 was only .012, which indicates that the higher-order term should not be included in the equation. Also, adding the product term $LMX \times CF$ to model 11 resulted in a nonsignificant coefficient ($p = .160$) and a change in adjusted R^2 of only .007. This finding indicates that the relationship between LMX and depersonalization is not moderated by communication frequency and Hypothesis 9 is rejected.

Analysis 4.8

The previously identified outlier was removed for this analysis. To minimize the lack of normality and heteroscedasticity in the regression residuals the transformed independent variables $JD^+ = \text{LOG}(JD)$, $LMX^+ = \text{SQRT}(k - LMX)$ and $CF^+ = \text{LOG}(CF)$ were used. For the dependent variable a technique described by Cohen et al., (2003: 238) was followed of inclusion of a constructed variable (W_i) in the regression equation to predict a value of λ for use in a Box Cox transformation of $DEP^{(\lambda)}$ (see section 3.3.7). The unstandardized coefficient for W_i was found to be significant, confirming the need for transformation (Cohen et al., 2003: 238). After a series of trials the optimum solution found was for a transformation $\lambda = .580$. The P-P plot and the scatterplot of regression standardized residuals with this transformation indicated a positive improvement (see figures A-4.5 and A-4.6, respectively, in appendix 4.2). The P-P plot did not indicate a serious violation of the assumption of nonnormality. Some level of heteroscedasticity was still indicated in the scatterplot and reliance is placed on the comment of Tabachnick and Fidell (2007: 127) that although heteroscedasticity weakens an analysis it does not invalidate it.

The results are shown in table 4.8 and as can be seen are largely unchanged from those of analysis 4.7. The unstandardized coefficient for the LMX^+ term in model 9^{++} was $B = .457$, $p = .002$, confirming the negative relationship with depersonalization (the reflect element of the transformation results in the positive coefficient corresponding to a negative relationship). The increase in the squared partial correlation, R^2 , of .078 again indicated a small to moderate effect size. The coefficient of the CF^+ term in model 10^{++} was again nonsignificant ($p = .735$). When the effect of the LMX^+ term was controlled for in model 11^{++} , the unstandardized coefficient was again found to be significant with $B = 2.269$, $p = .048$. The increase in the squared partial correlation R^2 of .034 if the CF^+ term was added to model 9^{++} to give model 11^{++} indicates a small effect size. Gender, tenure and job demand were not found to be significantly related to depersonalization. The maximum value for the Variance Inflation Factor (VIF) in this analysis was 1.27 indicating that multicollinearity was not a problem. The maximum Cook's distance and value of $DFBETA$ in this analysis were .115 and .36, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients.

TABLE 4.8 Regression Analysis for Transformed Dependent Variable Depersonalization (DEP^(λ)) (With Outlier Removed) and Independent Variables Gender, Tenure and Mean-Centered Transformed JD⁺, LMX⁺, and CF⁺

Variable	Model 8 ⁺⁺	Model 9 ⁺⁺	Model 10 ⁺⁺	Model 11 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	-.026 (.182)	-.014 (.175)	-.026 (.182)	-.008 (.173)
Gender	-.209 (.514)	-.239 (.496)	-.213 (.516)	-.270 (.490)
Tenure	.123 (.599)	.056 (.578)	.118 (.601)	.006 (.571)
Job Demand ⁺	.426 (3.095)	1.507 (3.044)	.352 (3.114)	1.383 (2.967)
LMX ⁺		.457** (.145)	-	.602*** (.161)
CF ⁺			.363 (1.068)	2.269* (1.134)
<i>F</i> value	.080	2.537*	.088	2.882*
Sig. <i>F</i> Change	.971	.002	.735	.000
<i>R</i> ²	.002	.080	.003	.111

Notes: $n = 127$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the F value, the significance refers to the change in the F value between models.

For model 10⁺⁺, the significance of the F change is from model 8⁺⁺.

Transformed dependent variable $DEP^{(\lambda)} = (DEP^{\lambda} - 1) / \lambda$, where $\lambda = .580$

Transformed dependent variables $JD^{+} = \text{LOG}(JD)$, $CF^{+} = \text{LOG}(CF)$ and $LMX^{+} = \text{SQRT}(k - LMX)$.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 4.9

To calculate the strength of the relationship between the variables, a Spearman Rank Order Correlation was conducted, which is the non-parametric alternative to Pearson's product-moment correlation. The results are shown in table 4.9. The control variables and communication frequency were not found to be significantly related to depersonalization. The negative relationship between LMX and depersonalization was again indicated with $\rho = -.242$, $p = .007$.

TABLE 4.9 Nonparametric Correlation Spearman’s Rho for Gender, Tenure, JD, LMX, CF, and DEP

Variable	1	2	3	4	5
1. Gender	-				
2. Tenure	-.112	-			
3. Job Demand (JD)	-.018	.003	-		
4. Leader Member Exchange (LMX)	.031	-.051	.058	-	
5. Communication Frequency (CF)	-.042	-.030	-.016	.431***	-
6. Depersonalization (DEP)	.033	.055	.029	-.242**	.028

Tests of significance were two-tailed. $n = 128$. $^{\dagger} p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

Analysis 4.10

Logistic regression analysis has been developed to handle dependent variables that lead to residuals that violate ordinary least squares assumptions (Cohen et al., 2003: 479). Also, in this study a number of individuals reported a zero level of depersonalization. It was decided to code depersonalization into two categories of no depersonalization reported (41.4%) and some level of depersonalization reported (55.5%) and conduct a logistic regression analysis. The control variables were entered in block 1 to give model 12. In the next step the CF term was added to give model 13 and test Hypothesis 13. The LMX term was added in the third step to give model 14 and test Hypothesis 2. The results are shown in table 4.10. The chi square value for the Hosmer-Lemeshow Test for model 14 was 2.834 with a significance of $p = .944$. This is larger than the lower cut off of $p = .05$ (Pallant, 2006: 167) and indicates support for the model. The Cox & Snell R square and Nagelkerke R square were .058 and .078, respectively, suggesting that between 5.8% and 7.8% of the variability is explained by this set of independent variables. From the Wald Test the only variable that was found to contribute significantly to the predictive ability of the model was LMX which had a coefficient of $B = -.085$, $p = .012$. The negative coefficient for LMX suggests that the higher the value of LMX the less likely it is that the individual will report experiencing depersonalization. For a model with LMX as the only independent variable the Cox & Snell R square and Nagelkerke R square were .052 and .069, respectively, suggesting that between 5.2% and 6.9% of the variability is explained by the LMX term. The coefficient for communication frequency was nonsignificant ($p = .451$). Gender, tenure and job demand were also found not to contribute significantly to the model. Tabachnick and Fidell (2007: 548) report that the odds ratio is “the increase (or decrease if the ratio is less than one) in odds of being in one outcome category when the value of the predictor increases by one unit”. For LMX the odds ratio was found to be .918 with a 95% confidence interval of .859 to .981. This indicates that that the higher the value of LMX the less likely the individual is to report suffering from depersonalization. For

every one unit increase in LMX the odds of the individual reporting suffering from depersonalization decreases by a factor of .918, all other factors being equal.

TABLE 4.10 Logistic Regression Analysis for Dependent Variable Depersonalization and Independent Variables Gender, Tenure, JD, LMX and CF

Variable	Model 12	Model 13	Model 14
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	-.065 (1.611)	-.047 (1.613)	-.379 (1.622)
Gender	.298 (.594)	.303 (.595)	.260 (.613)
Tenure	-.103 (.639)	-.109 (.640)	-.222 (.659)
Job Demand	.003 (.013)	.003 (.013)	.006 (.014)
CF		-.021 (.051)	.044 (.058)
LMX			-.085* (.034)
Omnibus test of Step Sig.	.949	.683	.009
Hosmer-Lemeshow Test (Sig.)	.429	.857	.944
Cox & Snell R^2	.003	.004	.058
Nagelkerke R^2	.004	.006	.078

Notes: A value of $p > 0.05$ for the Hosmer-Lemeshow Test indicates support for the model.

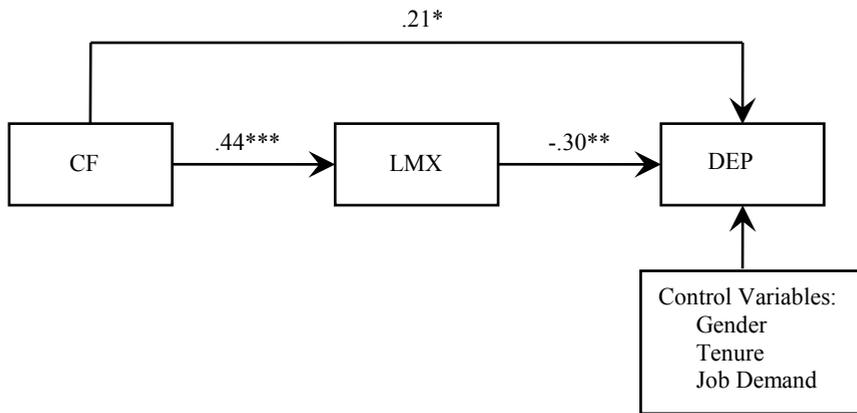
† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

4.3.5 Summary of Results for Dependent Variable Depersonalization

The results of analysis 4.7 require some caution in their consideration and interpretation. However, the findings are supported by analysis 4.8 and indicate that an individual's perception of the quality of the LMX relationship with their manager is negatively related to their levels of depersonalization with a moderate effect size (increase in the squared partial correlation R^2 of .091). Hypothesis 2 is supported. There is also evidence that communication frequency with the manager is positively related to an individual's levels of depersonalization, with a small effect size (increase in the squared partial correlation R^2 of .041), but only once the effects of the LMX relationship are controlled for. In analyses 4.9 and 4.10 the negative relationship between LMX and depersonalization was confirmed, giving further support to Hypothesis 2. The results of

analysis 4.10 suggest that in this sample the higher the value of the LMX quality the less likely the individual is to report suffering from depersonalization. The effect sizes found in analyses 4.7, 4.8 and 4.10 were very similar and suggest that LMX has a moderate effect size. The relationship between communication frequency and depersonalization was not confirmed in analysis 4.10. Neither of the control variables of gender or tenure or job demand were found to be significantly related to depersonalization. The results are summarized in figure 4.4.

FIGURE 4.4 Relationships between LMX, Communication Frequency and Depersonalization



Notes: Standardized coefficients are shown.

The relationship between CF and DEP is only significant when LMX is controlled.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

4.3.6 Analyses for Dependent Variable reduced Personal Accomplishment

The dimension of burnout of reduced personal accomplishment was found to be nonnormal (see section 3.3.7). Because skewness in the dependent variable is a source of skewness in the residuals (Cohen et al., 2003: 246), it was decided to conduct the initial analysis with the transformed variable $rPA^+ = rPA^\lambda$ (where, $\lambda = 0.7$) (see section 3.3.7). The previously conducted examination of z scores for each variable (see section 3.3.6) did not identify any potential outliers for the variables of rPA^+ , LMX and CF. The maximum value found was 2.80, which is well below the value of ± 3.30 (for a sample size less than 1000 and a criterion of $p = .001$) specified by Tabachnick and Fidell (2007: 128). Analysis 4.11 was the initial analysis for the dependent variable rPA^+ and the independent variables: gender, tenure and mean-centered JD, LMX and CF. In analysis 4.12 the effect of the nonnormality of independent variables on the results was investigated. In analysis 4.13 the results for the untransformed variable rPA were confirmed.

Analysis 4.11

In model 15⁺ the variables gender, tenure and job demand were entered into the equation. To test Hypothesis 3 the LMX term was added to the equation to give model 16⁺. To test Hypothesis 14 the CF term was added to the base model to give model 17⁺. The LMX term was then added to this model to give model 18⁺. The results of the analysis are shown in table 4.11. In model 16⁺ the LMX term had an unstandardized coefficient of $B = -.083$, $p = .033$. This indicates that the relationship between LMX and reduced personal accomplishment is negative, as expected, supporting Hypothesis 3. The increase in the squared partial correlation R^2 of .051 indicates a small effect size. The addition of the CF term to the base model to give model 17⁺ resulted in a decline in the adjusted R^2 value. Moreover, the coefficient was found to be nonsignificant ($p = .416$). No relationship was found between communication frequency and reduced personal accomplishment. Hypothesis 14 is not supported. Neither of the control variables or job demand were found to be significantly related to reduced personal accomplishment. Although not shown, the coefficients for the product term $LMX \times CF$ and the quadratic term CF^2 were found to be nonsignificant ($p = .117$ and $p = .208$, respectively) when added separately to model 18⁺ to test Hypotheses 10 and 19, indicating that the relationship between LMX and reduced personal accomplishment is not moderated by communication frequency, and that the relationship between communication frequency and reduced personal accomplishment is not curvilinear. No violation of assumptions was indicated from inspection of the P-P plot and scatterplot of regression standardized residuals (see figures A-4.7 and A-4.8, respectively, in appendix 4.2). The maximum value for the Variance Inflation Factor (VIF) in the analysis was 1.25, indicating multicollinearity was not a problem. The maximum Cook's distance and value of $DFBETA$ in this analysis were .107 and .035, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients.

Analysis 4.12

To check that the nonnormality of the dependent variables did not adversely influence the results, the analysis was repeated with the transformed variables: $JD^+ = \text{LOG}(JD)$, $CF^+ = \text{LOG}(CF)$ and $LMX^+ = \text{SQRT}(k - LMX)$. The results are shown in table A-4.6. As can be seen the results were not materially different. The transformed LMX^+ term was found to have an unstandardized coefficient of $B = .586$, $p = .014$. Once the reflect element of the transformation of LMX^+ was allowed for, the relationship between LMX and reduced personal accomplishment was again found to be negative. The transformed CF^+ term again had a nonsignificant coefficient ($p = .475$). No violation of assumptions was indicated from inspection of the normal probability plot and the scatterplot of the regression standardized residuals. Examination of relevant statistics indicated no concerns of multicollinearity or effects from outliers.

TABLE 4.11 Regression Analysis for Transformed Dependent Variable reduced Personal Accomplishment (rPA⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CF and LMX

Variable	Model 15 ⁺	Model 16 ⁺	Model 17 ⁺	Model 18 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	5.790*** (.290)	5.807*** (.286)	5.790*** (.290)	5.808*** (.287)
Gender	.685 (.820)	.629 (.809)	.699 (.822)	.625 (.813)
Tenure	.319 (.913)	.195 (.901)	.305 (.914)	.194 (.905)
Job Demand	.020 (.018)	.024 (.018)	.020 (.018)	.024 (.018)
LMX		-.083* (.038)	-	-.085 [†] (.043)
CF			-.059 (.073)	.010 (.080)
<i>F</i> value	.679	1.684	.675	1.339
Sig. <i>F</i> Change	.566	.033	.416	.050
<i>R</i> ²	.017	.054	.022	.054

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the F value, the significance refers to the change in the F value between models.

For model 17⁺, the significance of the F change is from model 15⁺.

Transformed dependent variable $rPA^+ = rPA^\lambda$, (where, $\lambda = 0.7$).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 4.13

The results for the analysis with the untransformed dependent variable reduced personal accomplishment are shown in table 4.12. As can be seen the results were not materially different from the previous analyses. The negative relationship between LMX and reduced personal accomplishment was confirmed with the LMX term having an unstandardized coefficient $B = -.231$, $p = .051$. The coefficient for the CF term was again found to be nonsignificant ($p = .572$). No violation of assumptions was indicated from inspection of the normal probability plot and the scatterplot of the regression standardized residuals. Examination of relevant statistics indicated no concerns of multicollinearity or effects from outliers.

TABLE 4.12 Regression Analysis for Dependent Variable reduced Personal Accomplishment (rPA) and Independent Variables Gender, Tenure and Mean-Centered JD, CF and LMX

Variable	Model 15	Model 16	Model 17	Model 18
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	13.163*** (.883)	13.212*** (.872)	13.162*** (.885)	13.216*** (.876)
Gender	2.547 (2.497)	2.392 (2.468)	2.576 (2.504)	2.361 (2.479)
Tenure	1.068 (2.779)	.721 (2.751)	1.037 (2.787)	.713 (2.762)
Job Demand	.067 (.055)	.077 (.054)	.067 (.055)	.078 (.065)
LMX		-.231 [†] (.038)	-	-.249 [†] (.131)
CF			-.125 (.221)	.078 (.243)
<i>F</i> value	.883	1.652	.739	1.332
Sig. <i>F</i> Change	.452	.051	.572	.059
<i>R</i> ²	.022	.053	.024	.054

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

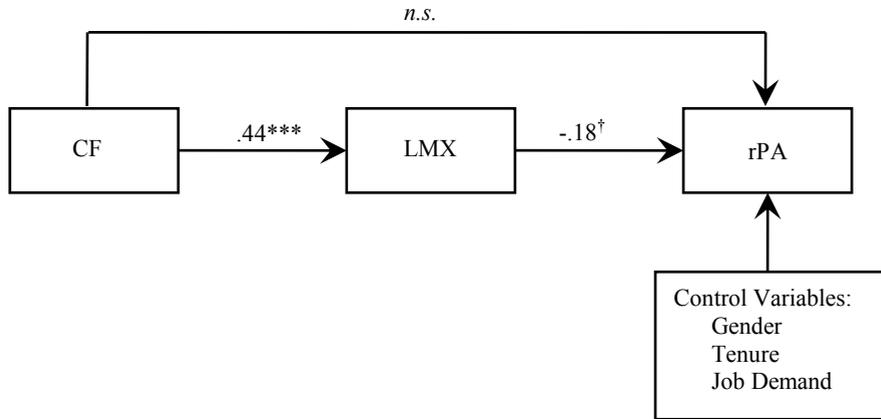
For model 17, the significance of the *F* change is from model 15.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

4.3.7 Summary of Results for Dependent Variable reduced Personal Accomplishment

The results of these analyses indicate that the quality of the individual's LMX relationship with their manager is negatively related to their level of reduced personal accomplishment with a small effect size (increase in the squared partial correlation R^2 of .032). Hypothesis 3 is supported. Communication frequency is found not to be significantly related to reduced personal accomplishment. Hypothesis 14 is rejected. Neither of the control variables of gender or tenure or job demand were found to be significantly related to reduced personal accomplishment. The results are summarized in figure 4.5.

FIGURE 4.5 Relationships between LMX, Communication Frequency and reduced Personal Accomplishment



Note: Standardized coefficients are shown.
n.s. indicates nonsignificance.
† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

4.3.8 Analyses for Dependent Variable Unidimensional Burnout Measure

The unidimensional burnout measure was found to be normally distributed (see section 3.3.7). Analysis 4.14 was the initial analysis for the dependent variable MBI and the independent variables gender, tenure, JD, LMX and CF. In analysis 4.15 the influence of the nonnormality of independent variables on the results of analysis 4.14 was investigated. In analysis 4.16 post hoc probing of the curvilinear relationship found between burnout and communication frequency was conducted.

Analysis 4.14

The control variables of gender and tenure were entered into the equation in model 19. To confirm the positive relationship between job demand and burnout the job demand term was added to this model to give model 20. To test Hypothesis 4 the LMX term was added to give model 21. To test whether LMX moderated the job demand-burnout relationship the product term $JD \times LMX$ term was added to model 21 to give model 22. To test Hypotheses 15 and 20 the linear CF term and then the quadratic CF^2 term were added to model 21 to give models 23 and 24, respectively. The results are shown in tables 4.13 and 4.14.

TABLE 4.13 Regression Analysis for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD and LMX

Variable	Model 19	Model 20	Model 21	Model 22
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	29.614*** (1.455)	29.617*** (1.442)	29.753*** (1.380)	29.746*** (1.383)
Gender	.551 (4.116)	.419 (4.081)	-.016 (3.903)	-.198 (3.927)
Tenure	2.084 (4.581)	2.217 (4.541)	1.246 (4.351)	1.850 (4.461)
Job Demand		.158 [†] (.089)	.187* (.086)	.176* (.088)
LMX			-.646** (.185)	-.660** (.187)
JD × LMX				-.008 (.012)
<i>F</i> value	.107	1.112	3.957**	3.234**
Sig. <i>F</i> Change	.899	.080	.001	.519
<i>R</i> ²	.002	.027	.118	.121

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the F value, the significance refers to the change in the F value between models.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

In model 19 neither of the control variables of gender or tenure was found to be significantly related to the unidimensional measure of burnout. In model 20 job demand was found to be positively related to burnout with an unstandardized coefficient of $B = .158$, $p = .080$. The significance of this term increased as LMX was added and controlled for ($B = .187$, $p = .031$ in model 21). The addition of the LMX term to model 20 to give model 21 resulted in a significant F change of $p = .001$. The unstandardized coefficient for the linear LMX term was significant and had a value of $B = -.646$, $p = .001$. The increase in the squared partial correlation R^2 of .090 indicates a moderate effect size (Cohen et al., 2003: 212). Although not shown, the quadratic LMX² term was not significant ($p = .605$), confirming the relationship between LMX and MBI as linear. Hypothesis 4 is supported. The addition of a product term JD × LMX term to model 21 to test moderation of the job demand relationship to the unidimensional measure of

burnout by LMX was found not to have a significant coefficient ($p = .519$). Hypothesis 7 is not supported.

TABLE 4.14 Regression Analysis for Dependent Variable Unidimensional Burnout and Independent Variables Gender, Tenure and Mean-Centered JD, LMX and CF

Variable	Model 21	Model 23	Model 24
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	29.753*** (1.380)	29.780*** (1.376)	31.811*** (1.665)
Gender	-.016 (3.903)	-.208 (3.895)	-.509 (3.842)
Tenure	1.246 (4.351)	1.194 (4.339)	1.019 (4.278)
Job Demand	.187* (.086)	.191* (.086)	.180* (.085)
LMX	-.646** (.185)	-.762*** (.205)	-.841*** (.206)
CF		.494 (.382)	1.051* (.461)
CF ²			-.155* (.074)
<i>F</i> value	3.957**	3.517**	3.754**
Sig. <i>F</i> Change	.001	.199	.038
<i>R</i> ²	.118	.131	.163

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

To test Hypotheses 15 and 20 the linear CF term and then the quadratic CF² term were added to model 21 to give models 23 and 24, respectively. The results are shown in table 4.14. The addition of the CF term in model 23 did not result in a significant *F* change ($p = .199$). However, when the quadratic CF² term was added to give model 24, this resulted in a significant *F* change of $p = .038$. The increase in the squared partial correlation *R*² from model 21 was .034, and the coefficients for the unstandardized coefficients for CF and CF², were $B = 1.051$, $p = .024$ and $B = -.155$, $p = .038$, respectively. It should be noted that the linear and quadratic terms for communication

frequency, CF and CF² were not found to be significant ($p = .662$ and $p = .197$, respectively) unless the LMX term was added to the model. These results indicate that the relationship between communication frequency and burnout is curvilinear, with a predominantly positive, concave downward-sloping curve, but only when the effect of the LMX relationship is controlled for. Hypotheses 16 and 17 are supported. Although not shown, moderation of the curvilinear relationship between communication frequency and unidimensional measure of burnout by the quality of the LMX relationship was not supported, as the product terms LMX \times CF and LMX \times CF² were found to have nonsignificant coefficients ($p = .699$ and $p = .110$, respectively).

Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions (see figures A-4.9 and A-4.10, respectively, in appendix 4.2). Inspection of Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results (maximum values of 1.851, .314 and -.164, respectively).

Analysis 4.15

To check as far as possible that the results were not adversely affected by the nonnormality of these variables, the analysis was repeated with the transformed independent variables $JD^+ = \text{LOG}(JD)$ and $LMX^+ = \text{SQRT}(k - LMX)$. The variable CF was not transformed as a non-linear transformation of this variable would have removed the curvilinear effect proposed. As can be seen from table A-4.7 (see appendix 4.3), once the reflect element of the transformation of LMX^+ is taken into account the results are not materially different from those of analysis 4.14 (shown in table 4.13 and 4.14). It is concluded that the findings have not been materially affected by the nonnormality of the independent variables job demand and LMX.

Analysis 4.16

The simple slopes of the curve were calculated by substituting the relevant coefficient values from model 23 (B_1 and B_2 refer to the unstandardized coefficients for the CF and CF² terms, respectively) and values for CF_L , CF_M and CF_H (corresponding to the mean value and values of \pm one standard deviation) into equation 4.3 (Aiken & West, 1991: 64) and are shown in table 4.15.

$$= B_1 + 2 \times B_2 \times CF \quad (\text{Equation 4.3})$$

TABLE 4.15 Simple Slopes for the Equation for Curvilinear CF and Burnout (MBI) Relationship

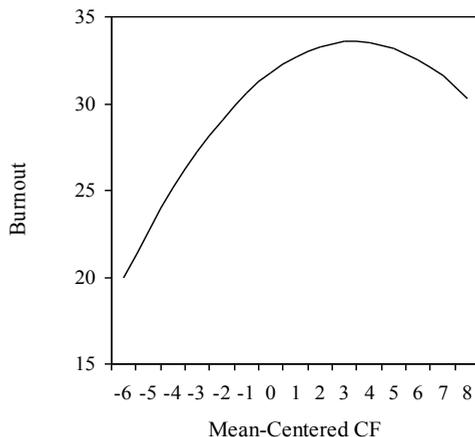
	$CF_L = -3.589$	$CF_M = 0$	$CF_H = 3.589$
Simple Slope	1.162	1.051	-.062

It can be seen from table 4.15 that the slope of the curve is upwards at low values of communication frequency. As the mean value is approached the slope becomes less steep. At a value of mean-centered CF of one standard deviation above the mean (3.59) the slope is almost flat, but slightly downward. The inflection point was calculated from equation 4.4 (Aiken & West, 1991: 76) to be at 3.39. This corresponds to the maximum value for burnout.

$$X \text{ at } Y_{max} = -B_1 / (2 \times B_2) \quad (\text{Equation 4.4})$$

To further assist with interpretation the curve was plotted over the range of scores found in the sample for the equation corresponding to model 23 ($B_1 = 1.051, p = .024; B_2 = -.155, p = .038; B_0 = 31.811, p = .000$) for females (value = 0), tenure greater than three months (value = 0) and the mean values of job demand and LMX (values = 0 due to mean centering). The plot is shown in figure 4.6.

FIGURE 4.6 Plot of Curvilinear Relationship between Communication Frequency and Burnout

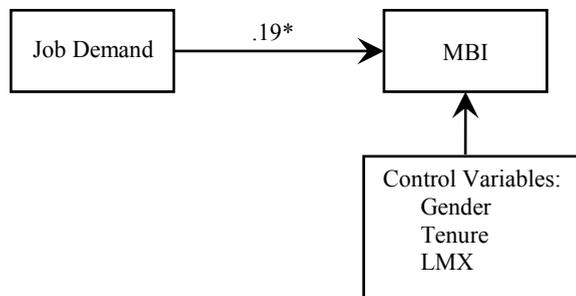


4.3.9 Summary of Results for Dependent Variable Unidimensional Burnout Measure

The results of these analyses indicate that LMX is negatively related to burnout with a moderate effect size (the increase in the squared partial correlation R^2 was .090). Hypothesis 4 is supported. The findings indicate that, similar to the case of emotional exhaustion, the relationship between communication frequency and burnout is curvilinear with a predominantly positive, concave downward-sloping curve. The increase in the squared partial correlation R^2 of .051 indicates a small effect size. There was no evidence of moderation of the relationship between communication frequency

and burnout by the quality of the LMX relationship. As expected, job demand was positively related to burnout. The increase in the squared partial correlation R^2 of .025 indicates a small effect size. Neither of the control variables of gender or tenure were found to be significantly related to burnout. To allow the comparison of effects of variables on the dependent variable across studies it is recommended that the standardized coefficient (β) is reported (Cohen et al., 2003: 154). For interaction terms however, unstandardized coefficients (B) are reported as standardized coefficients for interaction terms are not properly standardized and are therefore uninterpretable (Aiken & West, 1991; Frazier, Tix & Barron, 2004) and may lead to misinterpretation of the results (Jaccard & Turrisi, 2003: 68). The results are summarized in figures 4.7, 4.8 and 4.9.

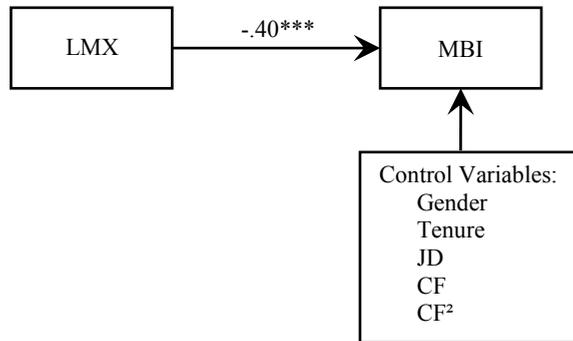
FIGURE 4.7 Relationship between Job Demand and Burnout



Notes: Standardized coefficient is shown.

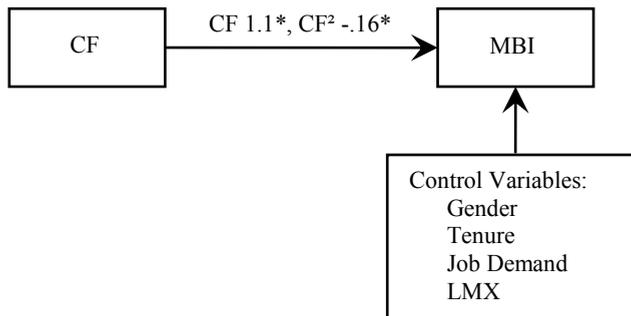
† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 4.8 Relationship between LMX and Burnout



Notes: Standardized coefficient is shown.
[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 4.9 Relationship between Communication Frequency and Burnout



Notes: For the interaction term, unstandardized coefficients are shown to prevent misinterpretation of the results.

The curvilinear relationship between CF and MBI is only significant when LMX is controlled for.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

4.3.10 Analyses for Dependent Variable Occupational Self-Efficacy

Occupational self-efficacy was found to be normally distributed for skewness ($z = -.014$) and to have a positive value of kurtosis, 1.96, ($z = 4.53$) (see section 3.3.7). This was not expected to be a problem in the analysis as underestimates of variance associated with positive kurtosis disappears in samples of more than 100 cases (Tabachnick & Fidell, 2006: 80). Analysis 4.17 was the initial analysis for the dependent

variable OCCSEFF and the independent variables gender, tenure, JD, LMX and CF. In analysis 4.18 the effect of the nonnormality of independent variables on the results of analysis 4.14 was investigated.

Analysis 4.17

The variables gender, tenure and job demand were entered in the first step to give model 25. To test Hypothesis 21 the LMX term was added to this model to give model 26. To test Hypothesis 22, the CF term was added to the base model to give model 27. To test Hypothesis 23, the LMX term was added to model 27 to give model 28. The results of analysis are shown in table 4.16.

TABLE 4.16 Regression Analysis for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CF and LMX

Variable	Model 25	Model 26	Model 27	Model 28
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	74.045*** (.768)	73.979*** (.740)	74.047*** (.748)	73.996*** (.736)
Gender	1.123 (2.171)	1.335 (2.094)	1.005 (2.116)	1.214 (2.084)
Tenure	1.557 (2.417)	2.032 (2.334)	1.684 (2.354)	1.999 (2.321)
Job Demand	-.026 (.048)	-.040 (.046)	-.027 (.046)	-.038 (.046)
LMX		.315** (.099)	-	.242* (.110)
CF			.509** (.187)	.312 (.204)
<i>F</i> value	.306	2.766*	2.096 [†]	2.702*
Sig. <i>F</i> Change	.821	.002	.007	.030
<i>R</i> ²	.008	.086	.065	.104

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 27, the significance of the change is from model 25.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As predicted LMX and communication frequency were found to be positively related to occupational self-efficacy. The unstandardized coefficients for the two terms were $B = .315$, $p = .002$ for the LMX term in model 26, and $B = .509$, $p = .007$ for the CF term in model 27. The increase in the squared partial correlation R^2 was .079 for the LMX term and .058 for the CF term, indicating a small to moderate effect size for LMX and a small effect size for communication frequency. Both Hypotheses 21 and 22 are supported. When the LMX term was added to model 26 to give model 27, the significance of the coefficient for the CF term became nonsignificant ($p = .130$). According to Baron and Kenny (1986) a variable is a mediator if:

1. there is a significant relationship between the independent variable and the dependent variable. In this case communication frequency was found to be positively and significantly related to occupational self-efficacy ($B = .509$, $p = .007$, model 27).
2. there is a significant relationship between the independent variable and the mediator. Communication frequency was found to be positively and highly significantly related to LMX ($B = .814$, $p = .000$) (see section 6.3.2).
3. the mediator still predicts the dependent variable after controlling for the independent variable. In model 28 LMX was still positively related to occupational self-efficacy ($B = .242$, $p = .030$) after controlling for communication frequency.
4. the relationship between the independent variable and the dependent variable is reduced when the mediator is in the equation. When the LMX term was added to the equation in model 28, the CF term coefficient changed from $B = .509$, $p = .007$ to $B = .312$, $p = .130$. Mediation is said to be full when the relationship becomes nonsignificant when the mediator is entered (Baron & Kenny, 1986; Hair et al., 2006: 844). It is therefore concluded that LMX fully mediated the relationship between communication frequency and occupational self-efficacy.

As a further check a Sobel test (see section 3.3.4) was conducted. The Sobel test statistic was 2.03, $p = .042$, confirming the significance of LMX as mediating the relationship between CF and OCCSEFF. Using the bootstrap approach proposed by Preacher and Hayes (2004), and the latest version of SPSS macros available (Preacher & Hayes, 2007), the 95% (two-tailed) confidence intervals were calculated as .0196 and .4174. Because zero does not lie in this confidence interval it can again be concluded that the indirect effect is significantly different from zero. Hypothesis 23 is supported and the findings confirm that the relationship between communication frequency and occupational self-efficacy is mediated by the quality of the LMX relationship. Neither of the control variables or job demand were found to be significantly related to occupational self-efficacy. Although not shown, the quadratic communication frequency term CF^2 was found to be nonsignificant ($p = .551$) when added to model 28.

Inspection of the normal probability plot (see figure A-4.11 in appendix 4.2) indicated a slight lack of normality of the residuals. The scatterplot of the regression standardized residuals (see figure A-4.12 in appendix 4.2) indicated no violation of assumptions. The maximum value for the Variance Inflation Factor (VIF) in the analysis was 1.25, indicating that multicollinearity was not a concern. The maximum Cook's distance and value of *DFBETA* in this analysis were .461 and .095, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients. In the original check for outliers, one case was found to have a *z* score above the limit of 3.29 recommended by Tabachnick and Fidell (2007: 73) at 3.89. No reason was found to omit this case from the analysis. To investigate the effect of the case on the results the analyses was repeated with the case removed. As expected from the inspection of the Cook's distance and *DFBETA* values (see above), there was no material change in the results except that the value of R^2 for model 28 increased from .104 to .129.

Analysis 4.18

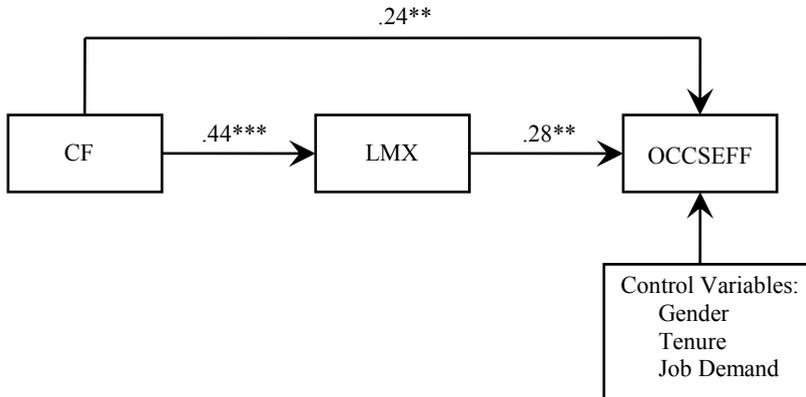
The analysis was repeated for the transformed variables: $JD^+ = \text{LOG}(JD)$, $CF^+ = \text{LOG}(CF)$ and $LMX^+ = \text{SQRT}(k - LMX)$ to assess the impact of the nonnormality of the independent variables on the results. As can be seen from table A-4.8 (see appendix 4), there were no material changes to the results. The positive relationships between LMX and communication frequency with occupational self-efficacy were confirmed with unstandardized coefficients of the relevant terms in models 26⁺⁺ (LMX) and 27⁺⁺ (CF) of $B = -1.820$, $p = .004$ and $B = 11.476$, $p = .008$, respectively. (Note the negative coefficient for the LMX term is due to the reflect element of the transformation). As before, when the LMX term was added to give model 28⁺⁺, the relationship between communication frequency and occupational self-efficacy became nonsignificant with $p = .124$. No violation of assumptions was indicated from inspection of the normal probability plot and the scatterplot of the regression standardized residuals. Examination of relevant statistics indicated no concerns of multicollinearity or effects from outliers.

4.3.11 Summary of Results for Dependent Variable Occupational Self-Efficacy

The results of these analyses indicate that both LMX and communication frequency are positively related to occupational self-efficacy. Hypotheses 21 and 22 are supported. The effect size for LMX was small to moderate (the increase in the squared partial correlation R^2 was .079); for communication frequency it was small (the increase in the squared partial correlation R^2 was .058). The findings also indicated that the relationship between communication frequency and occupational self-efficacy was mediated by the quality of the LMX relationship. Hypothesis 23 is supported. Neither of the control

variables or job demand were found to be significantly related to occupational self-efficacy. The results are summarized in figure 4.10.

FIGURE 4.10 Relationships between LMX, Communication Frequency and Occupational Self-Efficacy



Note: Standardized coefficients are shown.

The relationship between CF and OCCSEFF is fully mediated by LMX.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

4.4 DISCUSSION

4.4.1 LMX and Burnout

A central aim of this research was to provide an additional study to the relatively limited number that have considered the relationship between leadership and burnout in the work place. As predicted, LMX was found to be negatively related to the unidimensional measure of burnout and the each of the three components - emotional exhaustion, depersonalization and reduced personal accomplishment - and positively related to occupational self-efficacy. The effect sizes of LMX on burnout and occupational self-efficacy ($R^2 = .090$ and $R^2 = .079$, respectively), the size of the LMX term unstandardized coefficients for the negative relationship between LMX and emotional exhaustion, and the positive relationship with occupational self-efficacy ($\beta = -.40, p < .001$ and $\beta = .28, p < .01$, respectively) support the assertion by Cherniss (1980) that an individual's relationship with their supervisor is important in the prediction of burnout. These results also support the findings of Epitropaki and Martin (2005) and Martin et al. (2005) that LMX is positively related to employee well-being.

The results of this study are consistent with the other two studies of LMX and burnout known to the author at the time of writing this dissertation: Thomas (2005) and Bakker et al. (2005). Thomas (2005) measured emotional exhaustion using Form A of the Gillespie-Numerof Burnout Inventory. Applying structural equation modelling,

Thomas developed a model where LMX was found to have a direct negative effect on role stress, which was in turn positively related to emotional exhaustion. Bakker et al. (2005) measured burnout using the MBI-GS measure (Schaufeli et al., 1996), which has three subscales: emotional exhaustion, cynicism and professional efficacy. The standardized coefficients from the regression analyses in this study were very similar for each of the corresponding burnout components to those in the Bakker et al. (2005) study. A comparison of the results for the corresponding components of burnout is shown in table 4.17.

TABLE 4.17 Comparison of Results between this study and those of Bakker et al. (2005) for Relationships between LMX and Components of Burnout

	This Study (β)	Bakker et al. (2005) (β)
Emotional Exhaustion	-.24**	-.21***
Depersonalization	-.30**	-
Cynicism	-	-.41**
reduced Personal Accomplishment	-.18*	-
Occupational Self-Efficacy	.28**	-
Personal Efficacy	-	.33**

Note: Standardized coefficients are shown

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As can be seen, the results for emotional exhaustion were almost identical in the two studies, while the result for depersonalization in this study was similar in magnitude and of the same direction as its corresponding component in the Bakker et al. (2005) study of cynicism. Reduced personal accomplishment in this study was slightly lower than the personal efficacy measured in the Bakker et al. (2005) study, which was closer in value to that of occupational self-efficacy in this study. Consistent with the job demands-resources model of burnout (Demerouti et al. 2001; Schaufeli & Bakker, 2004), which predicts that job resources are primarily and negatively related to disengagement (Bakker et al., 2004), the effect size of LMX was found to be higher for depersonalization ($R^2 = .091$) than emotional exhaustion ($R^2 = .059$).

Although emotional exhaustion closely resembles traditional stress reactions (Cordes & Dougherty, 1993) and is the most similar of the three components to stress (Maslach, 1993), no evidence was found for a curvilinear relationship between LMX and emotional exhaustion and the findings of Harris and Kacmar (2006) were not replicated. This failure to replicate may be due to the fact that burnout develops over time and it may be that the measure of stress used by Harris and Kacmar (2006), adapted from

House and Rizzo's (1972) job-induced tension scale, is more immediate and more accurately reflects the pressure that may occur in high-quality exchange relationships due to the high levels of obligation experienced. It may also be that in the two samples studied by Harris and Kacmar (2006) employees had relationships where the manager had a higher control over resources than in this sample where many of the resources available to the individuals were available from collaboration with other organizations and central government.

4.4.2 The Relationships between LMX, Communication Frequency and Burnout

Another aim of the study was to investigate whether communication frequency was related to burnout. The results were not as predicted. It was expected that relationships would be negative, with an increased communication frequency being associated with a reduction in burnout. Interestingly, the results were as predicted for the relationship between communication frequency and occupational self-efficacy, with a positive relationship supported (see section 4.4.5 below).

Communication frequency was found to be related to both emotional exhaustion and the unidimensional measure of burnout with a curvilinear, predominantly positive, but concave downward-sloping relationship. For depersonalization a positive linear relationship was indicated, while for reduced personal accomplishment no significant relationship was supported. As previously mentioned, although only a few studies are available, the meta-analysis of six studies by Pfennig and Husch (1994; cited in Schaufeli & Enzmann, 1998: 83) consistently indicated a positive relationship between lack of feedback and all three dimensions of burnout (Schaufeli & Enzmann, 1998). More recently, Bakker et al. (2005) also found that the quality of feedback was negatively related to all three burnout dimensions.

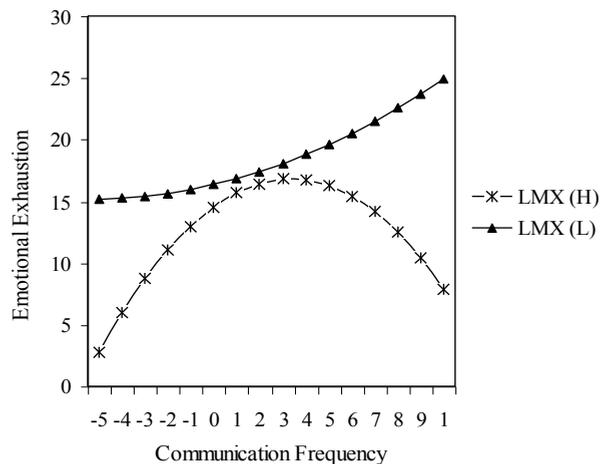
The studies of Pfennig and Husch (1994; cited in Schaufeli & Enzmann, 1998: 83) were not readily available to the author and so no details on how the lack of feedback was measured was determined. However, in the study of Bakker et al. (2005) performance feedback was measured with a three-item scale developed by Bakker et al. (2003). Ratings were made on a five-point scale (1 = *never*, 5 = *always*) and the example item quoted was "I get sufficient information about the goal of my work" (Bakker et al., 2003: 25). It may be that the negative relationships between feedback and burnout found in the previous research mentioned above relates to the individual's satisfaction with feedback rather than the frequency of feedback and communication.

The lack of equivalence between communication frequency and the individual's satisfaction with the quality and level of feedback in this study is supported by the fact that significant relationships were only found between communication frequency and emotional exhaustion, depersonalization and the unidimensional measure of burnout, once the quality of the LMX was controlled for. Significant prior research has shown

that high- and low-quality LMX relationships are characterized by different qualities and types of communication (see, for example, Dienesch & Liden, 1986; Fairhurst, 1993; Fairhurst & Chandler, 1989; Fairhurst et al., 1987; Graen & Uhl-Bien, 1995; Mueller & Lee, 2002) and this appears to be an important factor in understanding the results of this study. As noted by Flynn, Chatman and Spataro (2001) researchers have long assumed that increased contact frequency between individuals will lead to improved interpersonal relations. They posit that whilst some individuals will develop relationships through an increased contact frequency, others will not find the information appealing and increased contact may merely represent more exposure which may not be positive.

With reference to figure 4.11 it can be seen that in this study, individuals in low-quality LMX relationships experience higher levels of emotional exhaustion than those in high-quality LMX relationships at all levels of communication frequency.

FIGURE 4.11 Interaction between Communication Frequency and LMX Predicting Emotional Exhaustion (EE); (for regression of Emotional Exhaustion on Communication Frequency)



As a high-quality LMX relationship is associated with positive feedback and a low-quality LMX relationship with negative feedback the results are consistent with the speculation of Wright and Cropanzano (1998) that an employee who receives negative performance feedback may be more likely to experience emotional exhaustion than a person who received positive feedback. The curve for the low-quality LMX relationship is predominantly positive with an increasingly steep upward slope. This is consistent with the findings of Leiter and Maslach (1988) who in a study of nurses and support staff and their supervisors in a hospital found that unpleasant contact with the supervisor was an important source of interpersonal stress and played a role in the development of

emotional exhaustion. Low-quality LMX relationships are characterized by low trust (Graen & Uhl-Bien, 1995). Prior research has found a negative relationship between trust and the use of negative influencing tactics such as assertiveness (face to face confrontations, use of anger to try and force compliance) and upward appeal (coalition forming at hierarchical level above the target of influence) (Ringer & Boss, 2000). A direct negative relationship between LMX quality and the use of upward influencing tactics such as assertiveness has been established by Deluga and Perry (1991). Further, individuals suffering from emotional exhaustion are likely to resent their manager and perceive their manager's actions as unfair (Cropanzano et al., 2003). It seems reasonable to assume that the use of negative influencing tactics by the individual, unpleasant contact with the supervisor and their resentment will consume significant emotional energy and personal resources. The conservation of resources theory and primacy of loss argument (see section 2.1.6) predicts that this will have a large impact on the individual's level of emotional exhaustion. The increasing upward slope can be explained by the importance of contact frequency in influencing individual's attitudes and views (see, for example, Kacmar et al., 2003; Redman & Snape, 2002). It seems reasonable that, as the frequency of unpleasant contact with the supervisor increases, the individual will consume more personal resources and the level of emotional exhaustion will increase.

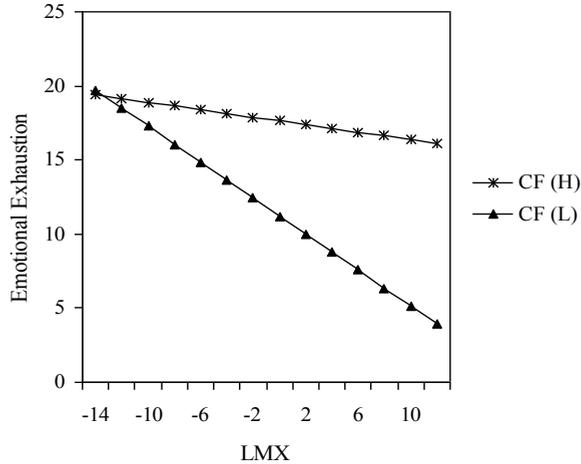
The curve for the high-quality LMX relationship starts with a steep upward slope and once it reaches a maximum value has a downward slope from there on. This can be interpreted as employees in high-quality LMX relationships experiencing an initial increasing level of emotional exhaustion and then a decreasing level. To explain these findings the research and comments of Seltzer et al. (1989), Podsakoff et al. (1990) and Podsakoff et al. (1996) is drawn upon. Research by Podsakoff et al. (1990) found that intellectual stimulation was negatively related to employee satisfaction. They comment that "although intellectual stimulation may produce desirable effects in the long run, it may be that in the short run, leaders who continually urge or exhort followers to search for new and better methods of doing things create ambiguity, conflict, or other forms of stress in the mind of the followers" (Podsakoff et al., 1990: 135). They also speculated that followers would suffer from stress due to increased task demands (Podsakoff et al., 1990). Seltzer et al. (1989) hypothesized that transformational leadership may lead to higher levels of employee burnout as an employee might work longer hours and put more energy into the job than an employee who was not working for a transformational leader. It may be that at low levels of communication frequency the manager finds it necessary to prioritize the need to encourage the individual to perform at a higher level, and develop more effective ways to achieve the performance required. Individuals in high-quality LMX relationships respect their manager (Graen & Uhl-Bien, 1995), feel a high level of loyalty (Dienesch & Liden, 1986) and feel obligated to try and perform. This may result in them working longer hours and putting more effort in to the tasks

required or suggested. It appears that as communication frequency increases, although the level of emotional exhaustion starts at a very low level, it will increase as the individual becomes activated and expends more resources on trying to meet the challenges and requirements set for them.

Ray (1987) suggests that even when the relationship with their manager is positive, due to the power inherent in the manager's role interactions may have risks for individuals. Albrecht and Adelman (1987c) identify that while there can be benefits from interactions with their manager, individuals can also incur relational costs through having to engage in impression or identity management. Individuals may feel the need to mask their true feelings in interactions and respond as expected, or if the manager expresses an adverse opinion about the individual, such as commenting on weaknesses or poor performance, this may reduce the individual's self-esteem and perceptions of personal control. The interaction itself may be uncertain and even when there is a slight concern that the manager's behaviour will be negative, the individual may become stressed about the interaction itself (Albrecht & Adelman, 1987c). It seems that it is reasonable to assume that issues of uncertainty would be more prevalent about the certainty of interactions when communication frequency is lower. Also, issues of impression and identity management would be larger when the relationship between the individual and their manager is valued by the individual.

Consistent with the above arguments, although an increase in LMX quality was found to be negatively related to emotional exhaustion for both high and low communication frequency (see figure 4.12), the slope of the line was steeper for the lower communication frequency. When facing difficult situations employees in high-quality LMX relationships can rely on their managers for emotional support (Dienesch & Liden, 1996; Sparrowe & Liden, 1997). It may be that once the communication frequency reaches a higher level, then the communication between the individual and the manager is characterized by the provision of emotional support and not by requests to find new ideas to improve performance. This results in a reduction in emotional exhaustion, as indicated in figure 4.11. The negative linear relationship between communication frequency and depersonalization can be explained in light of the above and consideration of Leiter's (1998) process model of burnout. The model posits that depersonalization arises as a result of emotional exhaustion, whilst the effects of environmental factors on depersonalization are mediated by emotional exhaustion. Post hoc analysis confirmed this effect for both communication frequency and LMX. Leiter's (1998) process model predicts that reduced personal accomplishment develops independently to emotional exhaustion and depersonalization. The finding that communication frequency was not significantly related to reduced personal accomplishment is consistent with that of Leiter and Maslach (1988) that reduced personal accomplishment was not affected by either pleasant or unpleasant supervisor contact.

FIGURE 4.12 Interaction between Communication Frequency and LMX predicting Emotional Exhaustion (for regression of Emotional Exhaustion on LMX)



4.4.3 Job Demands and Burnout

As expected from the job demands-resources model of burnout (Demerouti et al. 2001; Schaufeli & Bakker, 2004), which predicts that job demands are primarily and negatively related to emotional exhaustion (Bakker et al., 2004) and extensive prior research (see, for example, Cordes & Dougherty, 1993; Lee & Ashforth, 1996; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Bakker et al., 2005), job demand was found to be related to emotional exhaustion, but not to depersonalization or reduced personal accomplishment, although it was also found to be related to the unidimensional measure of burnout. The effect sizes for job demands on emotional exhaustion and burnout were small (increases in the squared partial correlations R^2 of .024 and .025, respectively), and the finding of Bakker et al. (2005) of moderation of the job demands relationship with emotional exhaustion by LMX was not evident in this study.

In previous research job demand has predominantly been measured by self-report measures relating to individual's perceptions of whether the quantitative work load can be done in the time available (see, for example, the meta-analytical review of Cordes & Dougherty, 1993). For example, Demerouti et al. (2001), Schaufeli and Bakker (2004) and Bakker et al. (2005) utilized a small number of self-report questions (three or five) that relate to the individual's perception of their level of work load and time pressure. For example: "I always have enough time to perform my duties" (Demerouti et al., 2001: 503). In this study, it was attempted to use an external measure of job demand: the level of performance against target in each local authority area corresponding to the relevant respondent measured by statistics from the Office of National Statistics was used as a

proxy for job demand (see section 3.2.7). This measure may suffer from a number of weaknesses. Firstly, it is not very immediate (due to the delay of publication of fourteen months), although it is used to assess individuals performance. Secondly, the average performance achievement was 120.1 % above target with only 6.3% of the individual's achieving a performance better than the target. Lazarus and Folkman (1984) posit in their cognitive appraisal model of stress (see section 2.1.9) that demands will not act as stressors, and impact negatively on an individual's mental and physical health, unless they are appraised as being threatening and the individual expects a loss or harm. Bandura (1995) also argues that it is the individual's beliefs rather than the objective situation that influences an individual's motivation, affective state and actions. It may be that the lack of performance against target was not appraised by the individuals in the study as a threat directly contributing to their immediate work load and time pressures. This may be the reason for the small effect sizes. (However, see section 5.4.2 for a further discussion of this issue and the findings relating to the role of personality factors influencing perceptions of this measure by respondents).

4.4.4 The Relationships between LMX, Communication Frequency and Occupational Self-Efficacy

Another aim of the study was to investigate the relationships between leadership and communication frequency with occupational self-efficacy. The results were as predicted with LMX and communication frequency both being found to have positive relationships with occupational self-efficacy. The findings relating to LMX and occupational self-efficacy were consistent with those of Murphy and Ensher (1999), and in particular with those of Schyns and von Collani (2002) and Schyns et al. (2005). Interestingly, the correlation between occupational self-efficacy and LMX in this study was higher than that found in the studies by Schyns and von Collani (2002) and Schyns et al. (2005) of German workers ($r = .27, p = .01$, $r = .17, p = .01$ and $r = .19, p < .001$, respectively). This may be due to the individuals in this study experiencing a higher level of performance ambiguity compared to first-line workers. The performance statistics for the individuals in this study are not available to them until fourteen months after the time to which they relate (see section 3.2.7). Bandura (1986) suggests that performance ambiguity arises when individuals cannot monitor their own performance or when levels of accomplishment are socially judged or ill-defined. Under these conditions Bandura (1986) posits that individuals will have to rely on others to judge how they are doing. Therefore, it may be that the individual's relationship with their manager will be more important in this case for the development of their occupational self-efficacy than in the case of shop floor workers who may have less performance ambiguity.

The positive relationship supported between communication frequency and occupational self-efficacy is consistent with prior research by Parker (1998) who found a positive relationship between communication frequency and self-efficacy in a

longitudinal study of employees in a glass-making factory. As predicted, LMX was found to fully mediate the relationship between communication frequency and occupational self-efficacy. As high-quality LMX relationships are characterized by more positive communication than low-quality LMX relationships (Dienesch & Liden, 1986), the findings of this study support Parker's (1998: 843) speculation that "the quality of communication might be a more important determinant of self-efficacy than simply the quantity."

It has been argued that self-efficacy is important for human well-being (Bandura, 1989; Maddux & Lewis, 1995) and positive relationships have been found between self-efficacy and mental health (Jex et al., 2001; Maddux & Meier, 1995) and the physiological stress system (O'Leary & Brown, 1995). The positive relationships between LMX quality and communication frequency with occupational self-efficacy can therefore be considered to have important indirect influences on an individual's well-being as well as the direct influences found on burnout and its components previously mentioned.

4.4.5 Conclusions

The findings of this chapter support the assertion of van Dierendonck et al. (2004) and Buunk and Schaufeli (1993) that the social context of the work place is an important factor for employee well-being, and those of Cordes et al. (1997) and Maslach (1993) that interpersonal interactions are a key factor in the burnout process. In particular, the findings are consistent with the results of van Dierendonck et al. (2004) that leaders play an important role in influencing employee well-being and support the statement that "poor supervisor-subordinate relationships characterized by low supervisor supportiveness, low quality of communication, and lack of feedback reduce individual well-being and contribute substantially to feelings of stress" (van Dierendonck et al., 2004: 165). As stated by Sparrowe and Liden (1997) it appears that the quality of the LMX relationship between an employee and their manager relates to the amount of emotional support and valued resources they receive and "is pivotal in determining the member's fate within an organization" (Sparrowe & Liden, 1997: 522).

As observed by Ray (1987), the relationships between social support and employee well-being is complex. In both the low- and high-quality LMX cases there was evidence of Kramer's (2004) speculation that more communication is not always better for an employee. Although support was not found for Harris and Kacmar's (2006) finding of a curvilinear relationship between LMX and emotional exhaustion, there was evidence of the possibility of negative outcomes for employees in high-quality LMX relationships. Communication frequency and LMX were found to interact in the prediction of emotional exhaustion. This provides support for the findings of Kacmar et al. (2004) that the importance of LMX is affected by the frequency of interaction. The findings do not support conventional wisdom that more open communication is associated with more

positive outcomes for the individual (Kramer, 2004). And, similar to the findings of Buunk and Schaufeli (1993) and Kramer et al. (2004), little support was found to support the uncertainty reduction theorem.

CHAPTER 5

THE IMPACT OF THE PERSONALITY TRAITS OF CONSCIENTIOUSNESS, NEUROTICISM AND WORK LOCUS OF CONTROL ON THE PERSONAL OUTCOMES OF BURNOUT AND OCCUPATIONAL SELF-EFFICACY

5.1 INTRODUCTION

There has been limited research into the role of individual characteristics and personality factors on burnout (Bakker et al., 2006; Kahill, 1988). Moore (2000) suggests that the research community has reached agreement that individual difference variables have little direct effect on the occurrence of burnout and that job factors are the key predictors. For example, Leiter and Maslach (1988) while recognising that burnout is a function of both environmental and personal factors state that research evidence has shown that environmental factors are more strongly related to burnout than personal factors such as personality variables (Leiter & Maslach, 1988). Cherniss (1993) also shares this view and notes that most research suggests that adverse organizational conditions are more significant in the etiology of burnout than personality factors. An early exception to this view was that of Pines (1993) who while recognizing that environmental conditions in the work place play a major role in determining whether individuals will achieve their goals and aspirations or will become burnt out, also recognizes that the environment is subjective and dependent on individual differences, goals and expectations.

As personality can be referred to as the way an individual thinks, feels or acts it seems reasonable to expect that personality factors will influence how a person reacts to the stressors they encounter in the work place (George & Brief, 2004). The cognitive appraisal model of stress (Lazarus & Folkman, 1984) (see section 2.1.9) recognizes the interaction between the person and the environment, and the role of the individual's perceptions as critical to the effect of environmental demands and outcomes. Lazarus and Folkman (1984) also identify the critical role of coping styles in an individual's attempts to manage the demands they face and are appraised as taxing or exceeding the resources available to them. Prior research has demonstrated that an individual's response to stressor effects and the coping mechanisms adopted are contingent on aspects of the individual's personality (see, for example, Connor-Smith & Flachsbart, 2007; Fusilier et al., 1987; George & Brief, 2004), with positive coping styles being related to well-being (see, for example, Jex et al., 2001; Koeske, Kirk & Koeske, 1993). In an attempt to incorporate cognitive approaches to stress and coping to the prediction of burnout, Leiter (1991) found empirical support that coping styles adopted by individuals significantly predicted burnout.

Theoretical frameworks for the role of personality characteristics in the etiology of burnout have been proposed. For example, the conservation of resources model (Hobfoll, 1989, 2001; Hobfoll & Freedy, 1993) (see section 2.1.6) recognizes the role of personality characteristics as important resources (Hobfoll, 1989) and the role of individual cognitive processes in the development of burnout (Lee & Ashforth, 1996). In a study based on the conservation of resources theory Wright and Hobfoll (2004) found that psychological well-being predicted burnout. They commented that their results “point to the importance of personality factors, especially psychological well-being, in the burnout process” (Wright & Hobfoll, 2004: 400). More recently, findings by Zellars et al. (2000) clearly indicated that personality plays a meaningful role in the development of burnout. They called for further research into the antecedent factors of burnout.

The research into self-efficacy and personality is also rather underdeveloped. Watson (2004: 146) comments “the overlap between personality and self-efficacy has remained rather a neglected area.” In situations that are weak, such as where there are few expectations, ambiguous demands or high levels of autonomy, individuals have discretion on how to behave. Under these conditions, individuals are more likely to engage in behaviours that are consistent with their personality traits (Barrick, Parks & Mount, 2005). As the environmental conditions in this study are weak (see section 3.1.1 for a description of the context of this study) it is expected that personality traits will be important in the prediction of burnout and occupational self-efficacy.

In this chapter, the relationships between an individual’s conscientiousness, neuroticism and work locus of control on each of the components of burnout, the unidimensional measure of burnout and occupational self-efficacy are investigated. This study attempts to address the call of Zellars et al. (2000) for further research into personality factors as antecedents of burnout, and that of Buunk and Schaufeli (1993) for further investigation into the possible moderating roles of personality characteristics. The study also provides additional research into the limited number of studies of the relationship between the personality traits and occupational self-efficacy. The relative importance of each of the personality traits of conscientiousness, neuroticism and work locus of control for burnout and occupational self-efficacy are investigated. In response to Erez and Judge’s (2001) recommendation that a single personality trait is often a poor predictor of performance and personality traits should not be tested in isolation, a hypothesis is generated from consideration of relevant theory and a three-way interaction of the three personality traits in the prediction of occupational self-efficacy is tested.

5.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES

5.2.1 Conscientiousness, Neuroticism, Work Locus of Control and Burnout

The possible relationships between conscientiousness, neuroticism and work locus of control and burnout are reviewed below in relation to the cognitive appraisal model

of stress, conservation of resources theory and the existential model of burnout. (Each theory is briefly discussed, and the reader is referred to sections 2.1.9, 2.1.6, and 2.1.5 for more detailed reviews). Previous research of each of the personality traits and burnout is considered and hypotheses are generated for investigation.

The Cognitive Appraisal Model of Stress

The cognitive appraisal model of stress (Lazarus & Folkman, 1984) emphasizes the effect of individual differences in motivation and cognition on their perceptions of environmental demands and outcomes. The model makes a distinction between the cognitive appraisal processes of primary and secondary appraisal. Primary cognitive appraisal is influenced by the individual's perception of the event, whether it involves harm or loss, threat or challenge. Factors such as their problem-solving skills and other skills that they may have influence this appraisal. The secondary appraisal process involves an evaluation of what might and can be done. It involves both an evaluation of the individual's assessment of their capabilities and resources in relation to the demands they face and the likelihood of the selected option succeeding. Major categories of resources identified by Lazarus and Folkman (1984) are health and energy (physical resources), positive beliefs (psychological resources) and problem-solving and social skills (competencies). Lazarus and Folkman (1984: 141) define coping behaviour that an individual adopts when faced with a stressor as the "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person." They make a distinction between "coping that is directed at managing or altering the problem causing the distress," *problem-focused coping*, and "coping that is directed at regulating emotional response to the problem," *emotion-focused coping* (Lazarus & Folkman, 1984: 150). Problem-focused forms of coping are similar to strategies used for problem-solving and are directed at efforts to define the problem, generate alternative solutions, evaluation of alternative solutions in terms of costs and benefits, choosing among them and acting. Emotion-focused forms of coping are cognitive processes directed at the reduction of emotional distress and can include avoidance, distancing, selective attention, positive comparisons, and the taking of positive viewpoints through cognitive reappraisal of negative events.

The relationship between coping style and well-being has been supported by empirical research. For example, a longitudinal study by Koeske et al. (1993) found that control coping (similar to problem-solving coping) had a significant buffering effect against the negative consequences of stress whilst there was no evidence of the benefit from avoidance coping (similar to emotion coping). Further, an exclusive use of avoidance coping strategies was found to be detrimental for the individual. Research by Jex et al. (2001) found that active coping was negatively related to psychological strain while avoidance coping was positively related. They concluded that it is advantageous

for an individual to use active or problem-solving coping over avoidance or emotional coping when faced with stressors in the work place.

Although burnout is considered as a measure of energy depletion and dysfunctional attitudes at work, it can be considered as a prolonged stress measure (Schaufeli & Enzmann, 1998). The component of emotional exhaustion can be regarded conceptually as the most similar to orthodox stress variables (Maslach, 1993; Cordes & Dougherty, 1993). It therefore seems reasonable to expect that the cognitive processes of primary and secondary appraisal and coping styles adopted as predicted by the cognitive appraisal model of stress will be important in the etiology of burnout. This is supported by the findings of Leiter (1991) of significant relationships between coping strategies and burnout. Control coping was found to be associated with decreased burnout on all three components, while escapist coping was associated with increased burnout. In a discussion of the findings, Leiter (1991) commented that “escapist coping appears to be a particularly ineffective means of avoiding burnout: if anything it is associated with higher levels of exhaustion” and “control coping, in contrast appears incompatible with burnout” (Leiter, 1991: 141).

Conservation of Resources Theory

Conservation of resources theory (Hobfoll, 2001; Hobfoll & Freedy, 1993) (see section 2.1.6) recognizes the role of environmental variables and individual cognitive processes in the etiology of burnout. The theory posits that burnout occurs when work demands consume resources at a greater rate than the employee can replenish them. Hobfoll (1989: 516) defines resources as “those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of those objects, personal characteristics, conditions, or energies.” Major demands include role ambiguity, role conflict, high workload and pressure, and the occurrence of stressful events.

The Existential Model of Burnout

The existential model of burnout (Pines, 1993; Pines & Aronson, 1998) (see section 2.1.5) argues that people have a need to believe that their lives are meaningful and will derive a sense of being useful and having significance through what they do, particularly in their work lives. An underlying assumption is that only motivated individuals will become burnt out and that goal attainment and success are critical antidotes to burnout.

Conscientiousness

Individuals high in conscientiousness tend to be dutiful, self-disciplined, organized, ambitious, hardworking, persistent, efficient at carrying out tasks, and achievement orientated (Barrick & Mount, 1993; Spangler et al., 2004). They tend to be capable, sensible, accomplished, thoughtful, more likely to engage in planning, and likely to be

able to persevere in the achievement of tasks (Costa et al., 1991). Those low in conscientiousness tend to be easy-going, less exacting on themselves and others, negligent, disorganized, lazy and aimless (Barrick & Mount, 1993; Spangler et al., 2004). As positive primary appraisal is related to factors such as problem-solving and other skills possessed by the individual and secondary coping is related to an evaluation of what can and might be done and the individual's evaluation of their capabilities, psychological resources, energy levels, and competencies, it follows that individuals high in conscientiousness are likely to make more positive primary and secondary appraisals. Prior research has shown that conscientiousness is a powerful predictor of coping (Watson & Hubbard, 1996). In a meta-analysis of the relations between personality and coping Connor-Smith and Flachsbart (2007) found that conscientiousness predicted higher levels of problem-solving coping and positive cognitive restructuring. Research by Watson and Hubbard (1996) found the relationship between conscientiousness and problem-solving coping to be strongest when the individual was faced with difficult circumstances. It follows that individuals high in conscientiousness are likely to adopt positive coping styles. Therefore, it is reasonable to expect that individuals high in conscientious will suffer lower levels of emotional exhaustion than those low in conscientiousness. Also, from Leiter's (1998) process model of burnout where depersonalization is predicted to develop as a result of emotional exhaustion it is expected that conscientiousness will be negatively related to depersonalization. From consideration of the cognitive appraisal model of stress and the prior research on conscientiousness, coping styles and burnout it is predicted that conscientiousness will be negatively related to all three burnout components and to the unidimensional measure of burnout.

Conscientiousness also pertains to feelings of control (LePine et al., 2004). It follows that individuals high in conscientiousness will have high levels of resources of personal characteristics and energies, and are likely to be efficient in the use of their resources and so will suffer from lower levels of resources depletion or being overcome by workloads and time pressures than individuals with low levels of conscientiousness. Therefore, from consideration of the conservation theory of resources it is predicted that individuals who are high in conscientiousness will experience lower levels of burnout.

Costa et al. (1991) conceptualized conscientiousness as having a proactive aspect of a need for achievement and commitment to work. Conscientiousness has been found to be related to performance motivation (Judge & Ilies, 2002), and individuals with high conscientiousness set ambitious goals and work hard to achieve them (Stewart & Barrick, 2004). Conscientiousness has been found to be a reliably predictor of job performance and work behaviour in a wide number of settings (Barrack & Mount, 1991; Barrick et al., 2001; Salgado, 1997). As conscientious individuals are likely to achieve more, they are more likely to feel useful and significant. They will also benefit from higher levels of goal attainment and success, and so suffer from lower levels of burnout.

Therefore, from consideration of the existential model of burnout it is predicted that individuals who are high in conscientiousness will experience lower levels of burnout.

Prior research on the relationship between conscientiousness and burnout has produced rather mixed findings. Research by both Bakker et al. (2006) in a study of 80 Dutch volunteer councillors, and by Zellars et al. (2000) in a study of 188 nurses in a large hospital in the United States, found conscientiousness not to be significantly correlated to any of the three components of burnout. A study by Deary, Blenkin, Agius, Endler, Zealley and Wood (1996) of 333 Scottish doctors found conscientiousness to be negatively correlated to emotional exhaustion ($r = -.22$) and reduced personal accomplishment ($r = -.35$), but not to depersonalization at a significance level of $p < .01$. Deary, Watson and Hogston (2003) in a longitudinal study of 168 nursing students in Scotland, found that twelve months into the course conscientiousness was not significantly correlated to emotional exhaustion or depersonalization, and was negatively correlated to personal accomplishment ($r = -.18$, $p < .05$). Twenty-four months into the course conscientiousness was again not found to be significantly correlated to emotional exhaustion, but was found to be negatively correlated to depersonalization ($r = -.37$, $p < .05$) and again to reduced personal accomplishment ($r = -.24$, $p < .05$). Piedmont (1993) in a longitudinal study of 36 occupational therapists in the USA found that conscientiousness was significantly correlated to reduced personal accomplishment ($r = -.46$, $p < .01$), but not to emotional exhaustion or depersonalization. LePine et al. (2004) in a study of 696 undergraduate students in a large south eastern university in the USA found that conscientiousness was negatively correlated to exhaustion as measured by the Pines and Aronson's (1981) Burnout Measure (Pines & Aronson, 1981; cited in LePine et al., 2004: 886).

To summarize, conscientiousness has been found to be negatively correlated to: emotional exhaustion in two of these six studies, to depersonalization in one of these five studies, and reduced personal accomplishment in four of these five studies. From consideration of the cognitive appraisal model of stress, conservation of resource theory and the existential model of burnout and consideration of previous research the following hypotheses are proposed for investigation:

Hypothesis 24 *Conscientiousness is negatively related to emotional exhaustion*

Hypothesis 25 *Conscientiousness is negatively related to depersonalization.*

Hypothesis 26 *Conscientiousness is negatively related to reduced personal accomplishment.*

Hypothesis 27 *Conscientiousness is negatively related to the unidimensional measure of burnout.*

Neuroticism

The six facets of neuroticism (Costa & McCrae, 1992; cited in Spangler et al., 2004: 255) are anxiety, angry hostility, depression, self-consciousness, impulsiveness

and vulnerability. Individuals who are high in neuroticism tend to be nervous, suffer from high levels of worry, are emotional and insecure, have feelings of inadequacy (Costa et al., 1986) and tend to view the world through a negative lens (Bono & Judge, 2004). They tend to worry about unpleasant situations, react negatively to unexpected events and take a long time to return to a normal emotional state (Spangler et al., 2004). Neurotic individuals are more likely to view an event as involving harm, loss or threat rather than challenge and so will suffer higher levels of stress. Costa et al. (1986) identify that neurotic individuals are stress prone, emotional, nervous, irritable and lacking in self-confidence. It can be expected that neurotic individuals are more likely to evaluate their capabilities and resources in relation to demands faced negatively and feel inadequate, and are likely to consume high levels of emotional energy through worrying. Prior research has found that neurotic individuals adopt coping behaviour that includes: hostility, escapism, blaming self, sedation, withdrawal, passive responses, difficulty making decisions and wishful thinking (McCrae & Costa, 1986).

Individuals high in neuroticism make less use of problem-solving coping, more use of avoidance, escapism, and confrontation (O'Brien & DeLongis, 1996). Neuroticism is positively related to passive coping, disengagement and denial (Watson & Hubbard, 1996). In their meta-analysis Connor-Smith and Flachsbart (2007) confirmed that neuroticism predicts the use of problematic strategies such as withdrawal, wishful thinking and emotion-focused coping. As previously mentioned, in a study of coping patterns as predictors of burnout Leiter (1991) found that escapist coping was positively related to all three components of burnout and that this form of coping was particularly ineffective and resulted in higher levels of exhaustion. Thus, as individuals high in neuroticism are more likely to make more negative primary and secondary appraisals of stressors and engage in negative coping patterns it is expected that neuroticism will be positively related to all three burnout components and to the unidimensional measure of burnout.

Individuals who are high in neuroticism tend to be less interested, have less energy, and are lacking in self-confidence. These factors result in them lacking achievement striving (Stewart & Barrack, 2004). They also have a lower capacity than emotionally stable (the opposite of neurotic) individuals to allocate resources and accomplish tasks (Barrick & Mount, 2005). Therefore, it is expected that individuals high in neuroticism will judge that they have lower levels of resources (personal characteristics, conditions, or energies that are valued by the individual) available to them, and be less efficient in the use of those resources than an individual low in neuroticism. As individuals who are high in neuroticism tend to be emotional, nervous, and suffer from high levels of worry (Costa et al., 1986) it also seems likely that when meeting demands they will consume resources at a faster rate than they can replenish them and hence will be more prone to burnout. Thus, from consideration of the conservation of resources model of burnout it is again predicted that neuroticism will be positively related to burnout.

As previously mentioned, emotional stability (the opposite of neuroticism) has been found to be a strong and consistent predictor of performance motivation (Judge & Ilies, 2002), and a reliable predictor of job performance and work behaviour in a wide number of settings (Barrack & Mount, 1991; Barrick et al., 2001; Salgado, 1997). As individuals high in neuroticism are likely to be less successful in achieving tasks and goals, and suffer from feelings of inadequacy (Costa et al., 1986). They are less likely to feel useful and achieve a sense of significance through what they do in their work lives. From consideration of the existential model of burnout (Pines & Aronson, 1998; Pines, 1993) it is again predicted that neuroticism will be associated with higher levels of burnout.

Prior research has consistently found neuroticism to be related to all three components of burnout (see, for example, Bakker et al., 2006; Deary et al., 1996; Francis et al., 2004; Hetland et al., 2007; LePine et al., 2004; Piedmont, 1993; Zellars et al., 2000). Therefore, the following hypotheses are included for investigation:

Hypothesis 28 *Neuroticism is positively related to emotional exhaustion.*

Hypothesis 29 *Neuroticism is positively related to depersonalization.*

Hypothesis 30 *Neuroticism is positively related to reduced personal accomplishment.*

Hypothesis 31 *Neuroticism is positively related to burnout.*

Work Locus of Control

Locus of control is a fundamental personality characteristic that refers to individual differences in a generalized belief in *internal* versus *external* control of reinforcement (Rotter, 1966). Individuals with a high internal locus of control, *internal individuals*, see themselves as active agents and believe that they are masters of their own fate and trust in their capacity to influence the environment. Individuals with an external locus of control, *external individuals*, see themselves as passive agents and believe that the events in their lives are due to uncontrollable forces such as chance and powerful others. Internal individuals are able to cope with failure better than externals (Lefcourt, 1976), are more resilient and do not consider defeat as a final state (Lefcourt, 1976). Internality of work locus of control has been found to be associated with perceptions of lower stressors and strains (Spector et al., 2004) and research by Fusilier et al. (1987) suggested that externals may respond to job-stress more strongly than internals. Internal individuals are more proactive than externals and will engage in positive coping strategies (Wanberg, 1997). Externals will see the source of stress as outside their control and so will cope less effectively than internals (Fusilier et al., 1987). Internality has been found to be positively related to problem-focused coping and negatively related to emotion-focused coping (Ng et al., 2006). Internals problem-solving ability is likely to be superior to that of externals as they are more inquisitive and curious than externals and are more efficient at processing information (Lefcourt, 1976). They are

more perceptive and prepared to learn about their environment (Boone et al., 1996; Miller & Toulouse, 1986). Also, when faced with failures internal individuals tend to forget unfavourable information (Phares, 1976). Storms and Spector (1987) found that externals are more likely than internals to react to normal organizational frustrations through sabotage, aggression and withdrawal. Research by Anderson and Schneier (1978) found that internal individuals tended to remain calmer, give support to others and form coalitions whilst external individuals tended to be more critical and show more emotion. Internals have been found to be more likely to take active steps to initiate and maintain social relationships in times of need (Fusilier et al., 1987).

An internal work locus of control has been found to be related to an individual's levels of commitment and morale (Furnham & Drakeley, 1993). Internal individuals are more likely to be persistent in the face of adversity because they believe they can control their environment. They are also more likely to perform in ambiguous and stressful situations that entail uncertainty (Boone et al., 2000). A consistent finding is that high internal individuals are associated with higher performance in organizations at an individual level (Boone et al., 1996; Blau, 1993; Howell & Shea, 2001; Judge & Bono, 2001; Lefcourt, 1976; Ng et al., 2006) and at a group level (Boone et al., 2005). Research into the relationship between chief executive officer (CEO) locus of control and small-medium-enterprise (SME) organizational performance (Boone et al., 1996; Miller & Toulouse, 1986) found that CEO locus of control is an important predictor of small firm performance. An important finding of Boone et al. (1996) was that internal CEOs achieved higher organizational performance irrespective of strategy content. This suggests that internals are more able to implement strategy than externals.

An external locus of control has been found to be related to anxiety, depression, general feelings of hopelessness and unhappiness (Lefcourt, 1976). Spector et al. (2002a) found that internal individuals reported less strain, more job satisfaction and a lower level of intention to quit. External individuals are generally more anxious than internals (Phares, 1976), and extensive prior research has shown that external individuals are more vulnerable and suffer higher levels of stress (see, for example, James & Wright, 1993; Spector, 1986). From the above discussion, it follows that internals are more likely to make positive primary and secondary appraisals of stressors, and adopt more positive coping strategies. They are likely to have more resources (personal characteristics, conditions, or energies that are valued by the individual) available to them, will be more efficient in the use of resources and more able to replenish them. They are also more likely to perform better, achieve their goals, and be successful in the work place. So they will be more likely to derive a sense of meaning and significance and will be less likely to experience burnout.

Prior research of locus of control and individual well-being has consistently shown a positive relationship (see, for example, Martin et al., 2005; Ng et al., 2006; Siu et al., 2002; Spector et al., 2002). In their meta-analytical review of locus of control at work

Ng et al. (2006) found that internal locus of control was negatively related to the three components of burnout, emotional exhaustion, depersonalization and reduced personal accomplishment with correlations of $r = -.27$, $r = -.25$, $r = -.16$ and $r = -.05$, respectively. Mazur and Lynch (1989) found that internality of locus of control was negatively correlated to all three components of burnout. In a study of 298 internal auditors in the USA Kalbers and Fogarty (2006) found that work locus of control was an important antecedent for burnout, being negatively related to all three components. The strongest relationship was for emotional exhaustion. Thus, the following hypotheses are proposed for investigation:

- Hypothesis 32** *Internality of work locus of control is negatively related to emotional exhaustion.*
- Hypothesis 33** *Internality of work locus of control is negatively related to depersonalization.*
- Hypothesis 34** *Internality of work locus of control is negatively related to reduced personal accomplishment.*
- Hypothesis 35** *Internality of work locus of control is negatively related to burnout.*

The job demands-resources model of burnout (Demerouti et al., 2001; Schaufeli & Bakker, 2004) identifies job demands as a source of stress in the work place and predicts that they are primarily and negatively related to emotional exhaustion (Bakker et al., 2004). Extensive prior research (see, for example, Cordes & Dougherty, 1993; Lee & Ashforth, 1996; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Bakker et al., 2005) has supported this relationship. In this study (see chapter 4) job demand was found, as expected, to be related to emotional exhaustion and the unidimensional measure of burnout, but not to depersonalization or reduced personal accomplishment. In the discussion above it has been argued that the personality traits of conscientiousness, neuroticism and work locus of control will influence perceptions of demands and the coping style adopted. At the time of writing this dissertation the author was not aware of any previous research testing the moderation of the relationships between job demands and emotional exhaustion by conscientiousness, neuroticism or work locus of control. In a study of two separate samples of 110 American health professionals and 214 American employees of a large contracting firm Schaubroeck and Merritt (1997) found that perceived control moderated the relationship between perceived job demands and resting blood pressure (systolic and diastolic). As resting blood pressure is related to an individual's level of stress, and conscientiousness and work locus of control pertain to feelings of control (LePine et al., 2004 and Rotter, 1966, respectively), these findings provide support for the possible moderation of the relationship between job demand and

emotional exhaustion by conscientiousness and work locus of control. Thus, the following hypotheses are proposed for further investigation:

- Hypothesis 36** *The relationship between job demand and emotional exhaustion is moderated by conscientiousness.*
- Hypothesis 37** *The relationship between job demand and emotional exhaustion is moderated by neuroticism.*
- Hypothesis 38** *The relationship between job demand and emotional exhaustion is moderated by internality of work locus of control.*

It is not predicted that any of the three personality traits of conscientiousness, neuroticism and work locus of control will moderate relationships between job demand and the other two burnout components of depersonalization and reduced personal accomplishment. However, due to the strength of the argument relating the relationships between the three personality traits to perceptions of stressors and coping styles adopted in response to stressors and the impacts that these factors have been found to have on individual well-being, the following hypotheses are also proposed:

- Hypothesis 39** *The relationship between job demand and burnout is moderated by conscientiousness.*
- Hypothesis 40** *The relationship between job demand and burnout is moderated by neuroticism.*
- Hypothesis 41** *The relationship between job demand and burnout is moderated by internality of work locus of control.*

5.2.2 Conscientiousness, Neuroticism, Work Locus of Control and Occupational Self-Efficacy

Self-efficacy (Bandura, 1986; 1989) (see section 2.2) refers to an individual's belief in their capabilities to organize and execute courses of action to successfully perform and manage in different situations. Occupational self-efficacy can be defined as "one's belief in one's own ability and competence to perform successfully and effectively in situations and across different tasks in a job" (Schyns & von Collani, 2002). Efficacy beliefs are a product of complex process of self-persuasion that relies on cognitive processing of diverse sources of efficacy information (Bandura, 1989). As previously mentioned, four sources of information that influence an individual's judgment of their self-efficacy are previous performance and achievement, vicarious experience of observing the performance of others, verbal and other forms of social persuasion from which people judge their capabilities, and their psychological state (Bandura, 1986; 1989).

An important element of the self-appraisal of efficacy is the outcome of proposed actions envisaged which acts as an agency through which an individual's motivation and actions are regulated (Bandura, 1989). As individuals make judgments based on their expectations of future performance their self-efficacy will be influenced by their state of arousal (Bandura, 1986). Gist and Mitchell (1992) observe that arousal, self-efficacy and future performance will be influenced by the individual's personality factors. They posit that in the development of self-efficacy three types of assessment processes are involved: analysis of task requirements, an attributional analysis of experience, and assessment of personal and situational resources and constraints. An individual's levels of confidence and perceptions will influence their assessment of the task difficulty. In their causal attributional analysis of previous experiences an individual's perceptions and beliefs of the level of effort and ability that was required, the role of luck in determining the outcome, and the level of task difficulty will influence their self-efficacy assessments (Gist & Mitchell, 1992). Perceived causes of success and failure share three common properties of causal locus (whether the cause is internal or external to the person), stability (whether constant or variable over time), and controllability (whether the cause is under volitional control or not) (Weiner, 1985). When making efficacy judgments, individuals will consider both internal and external factors, as well as the level of control they can exert (Gist & Mitchell, 1992). Self-efficacy can be expected to be higher when the individual believes their level of personal control is higher (Gist & Mitchell, 1992). The assessment of personal resources by the individual will involve an evaluation of personal factors such as their levels of skill, anxiety, desire, and the amount of effort they feel they have available (Gist & Mitchell, 1992).

Conscientiousness

As conscientiousness has been found to be a reliably predictor of job performance and work behaviour in a wide number of settings (Barrack & Mount, 1991; Barrick et al., 2001; Salgado, 1997) it can be expected that individuals who are high in conscientiousness will have a wide range of positive previous performance and achievements to draw on, which will positively influence their judgments of their self-efficacy. Individuals high in conscientiousness tend to be capable, sensible, accomplished, thoughtful, and more likely to engage in planning (Costa et al., 1991), and are self-disciplined, organized, and efficient at carrying out tasks (Barrick & Mount, 1993; Spangler et al., 2004). Conscientiousness has been found to be a powerful predictor of positive coping behaviours (Watson & Hubbard, 1996). In terms of judgment of capabilities, an interesting aspect is the finding in two samples by Barrick and Mount (1996) that conscientiousness was positively correlated to self-deception. Self-deception has been found to be positively related to achievement (Starek & Keating, 1991). Martocchio and Judge (1997: 766) speculated that "it seems likely that conscientious individuals use self-deception thought processes to try to achieve success

in work situations.” In a study of 97 university administrative employees, they found evidence that highly conscientious individuals tended to engage in higher levels of self-deception compared to individuals low on conscientiousness. Bandura (1989) also suggests that optimistic self-appraisal of capability by an individual can be advantageous to them as it will allow them to take on more challenging tasks and mount the extra effort to surpass ordinary performances, so gaining experience.

Conscientiousness is conceptualized as having a proactive aspect of a commitment to work and a need for achievement (Costa et al., 1991). Individuals higher in conscientiousness are more likely to set goals, and have higher expectations that their efforts will result in favourable consequences than those lower in conscientiousness (Barrick & Mount, 2005; Stewart & Barrick, 2004). Conscientiousness has also been found to be positively related to motivation to learn (Colquitt & Simmering, 1998). Individuals high in conscientiousness tend to be hardworking and persistent (Barrick & Mount, 1993; Spangler et al., 2004), while those low in conscientiousness tend to be easy-going, less exacting on themselves and others, negligent, lazy and aimless (Barrick & Mount, 1993; Spangler et al., 2004).

It follows that individuals who are high in conscientiousness are likely to have higher levels of achievements and positive experiences, which will positively influence their judgments of self-efficacy. Moreover, they are also more likely to make more positive evaluations of their capabilities and make more positive assessments of their personal resources, and their desire and the effort available to execute courses of action to successfully perform and manage in different situations. As the assessment of these personal resources (Gist & Mitchell, 1992) and capabilities (Bandura, 1986) are important for the development of self-efficacy it follows that conscientiousness will be positively related to occupational self-efficacy.

Prior research on conscientiousness and occupational self-efficacy appears to be quite limited. Research by Martocchio and Judge (1997) in a study of 97 American university administrative employees found that individuals high in conscientiousness were also high in generalized self-efficacy. As occupational self-efficacy has been found to be correlated to generalized self-efficacy (Schyns & von Collani, 2002) with a value of $r = .57$, (see section 3.2.2) it follows that conscientiousness should be positively related to occupational self-efficacy. Research by Cohrs, Abele and Dette (2006) in a study of three samples of German professionals (260 mathematics teachers, 323 professionals in business and 482 employees of private business) provided support for the positive relationship between conscientiousness and occupational self-efficacy. The following hypothesis is therefore proposed for investigation:

Hypothesis 42 *Conscientiousness is positively related to occupational self-efficacy.*

Neuroticism

Individuals higher in emotional stability (the opposite of neuroticism) are more likely to set goals, and have higher expectations that their efforts will result in favourable consequences than those lower in neuroticism (Barrick & Mount (2005). As previously mentioned, individuals who are high in neuroticism have a lower capacity than emotionally stable individuals to allocate resources and accomplish tasks (Barrick & Mount, 2005). Also, neuroticism has been found to be associated with problematic coping behaviours. As discussed above, these include escapism, passive responses, difficulty making decisions and withdrawal (McCrae & Costa, 1986), less use of problem-solving and more use of avoidance (O'Brien & DeLongis, 1996), and disengagement and denial (Watson & Hubbard, 1996). Emotional stability (the opposite of neuroticism) has been found to be a strong and consistent predictor of performance motivation (Judge & Ilies, 2002) and a reliable predictor of job performance and work behaviour in a wide number of settings (Barrack & Mount, 1991; Barrick et al., 2001; Salgado, 1997). It follows that individuals who are high in neuroticism are likely to have lower levels of previous performance and a lower number of positive experiences. As previous experience and achievement is the most important source of information influencing an individual's judgment of their self-efficacy (Bandura, 1986), it follows that individuals who are high in neuroticism are likely to judge their levels of occupational self-efficacy as lower than individuals who are low in neuroticism. Self-efficacy judgments are also influenced by the individual's psychological state (Bandura, 1986), the individual's judgment of their capabilities (Bandura, 1986), and their evaluation of personal factors such as their levels of skill, anxiety, desire, and the amount of effort they feel they have available (Gist & Mitchell, 1992). Conger and Kanungo (1988) observe that individuals are more likely to feel competent when they are not experiencing strong aversive arousal. Individuals who have an emotional arousal state that results from stress, fear, anxiety, or depression, both on and off the job, will lower self-efficacy expectations (Conger & Kanungo, 1988). Individuals who are higher in neuroticism tend to be nervous, suffer from high levels of worry, are emotional and insecure, and have feelings of inadequacy (Costa et al., 1986), and they tend to be less interested, have less energy, lack self-confidence, and lack achievement striving (Stewart & Barrack, 2004). Thus, it is predicted that neuroticism will be negatively related to occupational self-efficacy.

Prior research has supported a negative relationship between neuroticism and self-efficacy judgments across a range of measures. In a study of 126 American workers in a manufacturing organization Thoms, Moore and Scott (1996) found neuroticism to be significantly negatively related to generalized self-efficacy for participating with a correlation of $r = -.37$. In a meta-analytical analysis of 12 samples and roughly 15 000 individuals Judge, Erez and Bono (1998) found a correlation between generalized self-efficacy and neuroticism of $r = -.54$. In research relating to occupational self-efficacy of

153 German university students Schyns and von Collani (2002) found a large correlation between neuroticism and occupational self-efficacy of $r = -.51$. The negative relationship between neuroticism and occupational self-efficacy was also confirmed in the study of three samples of German professionals (260 mathematics teachers, 323 professionals in business and 482 employees of private business) by Cohrs et al. (2006). Thus, the following hypothesis is included for investigation:

Hypothesis 43 *Neuroticism is negatively related to occupational self-efficacy.*

Work Locus of Control

Locus of control can be considered as a predictor of an individual's tendency to attempt to exert active control over their environment (Ng et al., 2006). Phares (1976) states that the "basic characteristic of internal individuals appears to be their greater efforts at coping with or attaining mastery over their environments. To a great extent, the superior mastery and coping of internals seems to be accomplished through their superior cognitive processing activities. They seem to acquire more information, make more attempts at acquiring it, are better at retaining it, are less satisfied with the amount of information they possess, are better at utilizing it, and generally pay more attention to relevant cues in a situation" (Phares, 1976: 78). Internal individuals not only have better problem-solving skills than externals, but are also more likely to be persistent in the face of adversity because they believe they can control their environment (Phares, 1976). The findings of Boone et al. (1996) suggest that internal individuals also have higher levels of implementation skills. A consistent finding is that high internal individuals are associated with higher performance in organizations at an individual level (Boone et al., 1996; Blau, 1993; Howell & Shea, 2001; Judge & Bono, 2001; Lefcourt, 1976; Ng et al., 2006) and at a group level (Boone et al., 2005). Gist and Mitchell (1992) posit that the causal attributional analysis of previous experience will be influenced by the individual's beliefs of causal locus and controllability.

It follows that internal individuals will recall higher levels of previous performance and achievement, will believe them to have been achieved through their own efforts, and are more inclined to believe that they can control events in the future. Also, when faced with failures internal individuals tend to forget unfavourable information (Phares 1976). An external locus of control has been found to be related to anxiety, depression, general feelings of hopelessness and unhappiness (Lefcourt, 1976). Thus, internals are also likely to make more positive judgments of their capabilities, psychological state and evaluations of personal factors such as their levels of skill, anxiety, desire, and the amount of effort they feel they have available than external individuals. Research by Anderson and Schneier (1978) found that internal individuals tended to remain calmer, give support to others and form coalitions, whilst external individuals tended to be more critical and show more emotion. Internals have been found to be more likely to take

active steps to initiate and maintain social relationships in times of need (Fusilier et al., 1987). This is likely to influence them to make positive judgments of situational resources available to them which will again positively influence their judgments of their self-efficacy.

Prior research has supported a positive relationship between internality of locus of control and self-efficacy. In meta-analytical studies by Judge et al. (1998) and Ng et al. (2006) positive correlations ($r = .45$ and $r = .28$, respectively) were found between locus of control internality and generalized self-efficacy. In research relating to occupational self-efficacy and locus of control Schyns and von Collani (2002) found a correlation of $r = .49$. In two studies the correlation between locus of control (Rotter, 1966) and work locus of control (Spector, 1988) was found to be $r = .54$ (Spector, 1988) and $r = .50$ (Blau, 1993). Thus, the following hypothesis is included for investigation:

Hypothesis 44 *Internality of work locus of control is positively related to occupational self-efficacy.*

Erez and Judge (2001) recommended that a single personality trait is often a poor predictor of performance and personality traits should not be tested in isolation. Also, Barrick and Mount (2005) observe that personality is a distal motivational force that will influence behaviour through proximal motivation variables such as goals and expectancies. Social learning theory (Rotter, 1954) states that generalized expectancies are important to explain behaviour in uncertain and ambiguous situations. The theory predicts that a person's actions are predicted on the basis of their values, expectations, and the situation they find themselves in (Lefcourt, 1976). Locus of control is conceptually rooted in social learning theory and pertains to individual differences in a generalized belief in *internal* versus *external* control of reinforcement (Rotter, 1966).

The case for a positive relationship between conscientiousness and occupational self-efficacy has already been presented above. From consideration of Gist and Mitchell's (1992) theoretical analysis of self-efficacy and the importance of attributional analysis of past performance and beliefs on the ability to control future performance, it may be that the relationship between conscientiousness and occupational self-efficacy is moderated by work locus of control. As previously mentioned, individuals with a high internal locus of control, *internal individuals*, see themselves as active agents and believe that they are masters of their own fate and trust in their capacity to influence the environment. Individuals with an external locus of control, *external individuals*, see themselves as passive agents and believe that the events in their lives are due to uncontrollable forces such as chance and powerful others. It may be that an individual who is high in conscientiousness will not make a positive judgment of past experience and performance if they are external in locus of control, and will not be motivated to exert effort if they do not believe that their actions will influence the outcomes. An

individual's psychological state is also an important factor in the development of self-efficacy judgments (Bandura, 1986). Gist and Mitchell (1992) argue that while the analysis of task requirements and attributional analysis of past experience are required, they are not sufficient to allow the formation of self-efficacy. They argue for the importance of a third assessment of the self, the setting and the availability of specific resources. This assessment requires consideration of personal factors such as skill level, anxiety level, desire and available effort, and of the situational factors such as competing demands and distractions that will impact on performance. As previously mentioned, neurotic individuals suffer from high levels of worry, are emotional and insecure, have feelings of inadequacy (Costa et al., 1986), tend to view the world through a negative lens (Bono & Judge, 2004), tend to worry about unpleasant situations, react negatively to unexpected events, take a long time to return to a normal emotional state (Spangler et al., 2004) and have less energy (Stewart & Barrack, 2004). Further, as previously mentioned, individuals who are high in neuroticism have a lower capacity than emotionally stable individuals to allocate resources and accomplish tasks (Barrick & Mount, 2005). It can be expected that an individual's psychological state and the assessment that they make of their personal factors and the situational factors will be further contingent on their level of neuroticism. Therefore the following hypothesis is proposed for investigation:

Hypothesis 45 *The three-way interaction between conscientiousness, neuroticism and work locus of control is significantly related to occupational self-efficacy.*

5.3 ANALYSIS AND RESULTS

5.3.1 Initial Analysis

All scales used in the analysis were found to have adequate reliability with Cronbach's alphas above $\alpha = .70$, (emotional exhaustion $\alpha = .88$, depersonalization $\alpha = .74$, reduced personal accomplishment $\alpha = .88$, unidimensional measure of burnout $\alpha = .86$, occupational self-efficacy $\alpha = .89$, work locus of control $\alpha = .84$, neuroticism $\alpha = .81$ and conscientiousness $\alpha = .76$, see table 3.1). Descriptive statistics for the variables are shown in table 3.17. Neuroticism, work locus of control and the unidimensional measure of burnout were found to be normally distributed (see section 3.3.7). The following nonlinear transformations (see section 3.3.7) were used as appropriate to check for the nonnormality of distribution of variables on the results of analyses: $EE^+ = \text{SQRT}(EE)$, $rPA^+ = (rPA)^\lambda$ (where, $\lambda = 0.7$), $JD^+ = \text{LOG}(JD)$ and $\text{CONSC}^+ = \text{SQRT}(k - \text{CONSC})$.

To check if common-method variance (Podsakoff & Organ, 1986) was a problem (see section 3.4) Harmon One-Factor tests (Podsakoff et al., 2003) (see section 3.4.2) were conducted. For each analysis the relevant items for the scales were loaded into an

exploratory factor analysis, to subsequently examine the unrotated factor solution. For the emotional exhaustion, depersonalization, reduced personal accomplishment and unidimensional measure of burnout analyses the first factor extracted accounted for 19.0%, 16.3%, 16.9% and 17.0%, respectively. In the occupational self-efficacy analysis the first factor accounted for 19.3% of the variance. As no single factor emerged from the factor analyses and one general factor was not found for the majority of the covariance in the independent and dependent variables, it is suggested that CMV is not a pervasive problem in these analyses.

As a further check, a confirmatory factor analysis was conducted to confirm that the items loaded cleanly onto the correct constructs. A nonorthogonal rotation method of Oblique rotation was used. In Oblique rotation the pattern matrix is used for interpretation purposes (Hair et al., 2006: 153; Tabachnick & Fidell, 2007: 625). These are shown for each analysis in tables A-5.1, A-5.2, A-5.3 and A-5.4 (see appendix 5.1). Because factor loadings above $\pm .30$ to $\pm .40$ are considered as the minimum acceptable (Hair et al., 2006: 129) only factor loadings above .35 are shown. Hair et al. (2006: 128) state that only factor loadings of .50 and above are significant for a sample of 120 at a significance of $p < .05$, and this decreases to .45 as the sample size increases to 150. For these reasons only values above .49 are considered as significant in this analysis. As can be seen in tables A-5.1, A-5.2 and A-5.3, all the items loaded cleanly on to their respective factors with a small number of cross-loadings between conscientiousness and neuroticism, none of which were significant. As the factor analysis of these two personality traits (see section 3.2.5) had previously found that they loaded cleanly on to their respective factors, this is not considered to be a problem. In table A-5.4 two items of the occupational self-efficacy scale had significant cross-loadings of -.51 (OCCSEFF 1) onto the factor corresponding to the personal control subscale of work locus of control and of -.47 (OCCSEFF 4) onto the factor corresponding to neuroticism. Repeating the factor analysis with four factors being extracted corresponding to conscientiousness, neuroticism, work locus of control and occupational self-efficacy resulted in cleaner loading of the items onto their respective factors with no significant cross-loadings.

Bivariate correlations were calculated for the variables and are shown in table 5.1. As predicted, conscientiousness was negatively correlated to the unidimensional measure of burnout and all three components: unidimensional measure of burnout ($r = -.354, p = .000$), emotional exhaustion ($r = -.295, p = .001$), depersonalization ($r = -.264, p = .003$) and reduced personal accomplishment ($r = -.214, p = .017$), and positively correlated to occupational self-efficacy ($r = .362, p = .000$). Also as predicted, neuroticism was positively correlated to the unidimensional measure of burnout and all three components - unidimensional measure of burnout ($r = .440, p = .000$), emotional exhaustion ($r = .485, p = .000$), depersonalization ($r = .207, p = .021$), reduced personal accomplishment ($r = .186, p = .039$) - and negatively correlated to occupational self-efficacy ($r = -.410, p$

= .000). Again, as predicted, work locus of control was negatively correlated to the unidimensional measure of burnout and all three components - unidimensional measure of burnout ($r = -.374, p = .000$), emotional exhaustion ($r = -.331, p = .000$), depersonalization ($r = -.302, p = .001$), reduced personal accomplishment ($r = -.321, p = .000$) - and positively correlated to occupational self-efficacy ($r = .374, p = .000$).

Conscientiousness was negatively correlated to neuroticism ($r = -.355, p = .000$) and positively to work locus of control ($r = .186, p = .040$). Work locus of control and neuroticism were not significantly correlated ($p = .212$). Job demand was positively correlated to burnout ($r = .159, p = .078$), as expected, and negatively correlated to work locus of control ($r = -.218, p = .016$). The maximum correlation between independent variables included in the analyses is .355, which is less than the upper limit of .7 recommended by Tabachnick and Fidell (2001: 84) for the reduction of the risk of multicollinearity. As discussed in section 3.3.9 the independent variables were mean-centered before being entered into the regression equations.

5.3.2 Analysis for Dependent Variable Emotional Exhaustion

Because emotional exhaustion was found to be nonnormal, as previously (see section 4.3.2) the initial analysis was conducted with the transformed dependent variable $EE^+ = \text{SQRT}(EE)$. In analysis 5.1, the individual relationships of conscientiousness, neuroticism and work locus of control with emotional exhaustion and their relative importance was investigated, and Hypotheses 24, 28, and 32 were tested. In analysis 5.2, the effect of the nonnormality of the independent variables JD and CONSC on the results was confirmed. In analysis 5.3, the analysis was repeated for the untransformed dependent variable emotional exhaustion.

In analysis 5.4, interaction effects between job demand and the three personality variables in the prediction of EE^+ were investigated, and Hypotheses 36, 37 and 38 were tested. In analysis 5.5, an investigation was conducted to eliminate the possibility of a misspecification of the model being responsible for the significant interaction found between work locus of control and job demand. Analysis 5.6 investigated the effects of nonnormality of variables on the results of analysis 5.4. In analysis 5.7, the interaction between job demand and work locus of control was confirmed for the untransformed dependent variable emotional exhaustion, and post hoc probing of the interaction was undertaken.

Analysis 5.1

The control variables were entered into the equation in model 1⁺. To test Hypotheses 24, 28 and 32 the CONSC, NEURO and WLCS terms were individually added to the base model to give models 29⁺, 30⁺ and 31⁺, respectively.

TABLE 5.1 Bivariate Correlations for Gender, Tenure, Job Demand, CONSC, NEURO, WLCS, EE, DEP, rPA, MBI and OCCSEFF

Variable	1	2	3	4	5	6	7	8	9	10
1. Gender	-									
2. Tenure	.112	-								
3. Job Demand	-.020	-.019	-							
4. Conscientiousness	-.086	-.061	-.065	-						
5. Neuroticism	-.017	.045	.001	-.355***	-					
6. Work Locus of Control	.070	.041	-.218*	.186*	-.113	-				
7. Emotional Exhaustion	-.058	-.008	.126	-.295**	.485***	-.331***	-			
8. Depersonalization	-.075	.179*	.085	-.264**	.207*	-.302**	.329***	-		
9. reduced Personal Accomplishment	.091	.023	.112	-.214*	.186*	-.321**	.148	.275**	-	
10. Burnout (MBI)	.008	.040	.159 [†]	-.354***	.440***	-.448***	.748***	.541***	.747***	-
11. Occupational Self-Efficacy	.040	.055	-.050	.362***	-.410***	.374***	-.345***	-.251**	-.380***	-.483***

Tests of significance were two-tailed. $n = 128$. [†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

To study the relationships when controlling for each of the other personality characteristics the NEURO term was added to model 29⁺ to give model 32⁺ and the WLCS term was added to model 29⁺ to give 33⁺. To determine the relative importance of the three personality variables all three terms were included in model 34⁺. The results are shown in tables 5.2 and 5.3.

TABLE 5.2 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 1 ⁺	Model 29 ⁺	Model 30 ⁺	Model 31 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	3.692*** (.113)	3.712*** (.108)	3.697*** (.099)	3.677*** (.108)
Gender	-.255 (.320)	-.355 (.307)	-.234 (.279)	-.165 (.306)
Tenure	-.098 (.356)	-.186 (.341)	-.182 (.311)	-.041 (.340)
Job Demand	.007 (.007)	.006 (.007)	.007 (.006)	.002 (.007)
CONSC		-.066** (.019)	- -	- -
NEURO			.090*** (.014)	- -
WLCS				-.050*** (.014)
<i>F</i> value	.568	3.567**	10.269***	3.786**
Sig. <i>F</i> Change	.637	.001	.000	.000
<i>R</i> ²	.014	.108	.258	.114

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 30⁺ and 31⁺, the significance of the *F* change is from model 1⁺.

Transformed dependent variable EE⁺ = SQRT (EE).

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 5.3 Regression Analyses for Dependent Variable Transformed Emotional Exhaustion (EE⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 29 ⁺	Model 32 ⁺	Model 33 ⁺	Model 34 ⁺	Beta (β)
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	
Constant	3.712*** (.108)	3.706*** (.098)	3.695*** (.105)	3.692*** (.094)	
Gender	-.355 (.307)	-.285 (.278)	-.262 (.298)	-.202 (.269)	.058
Tenure	-.186 (.341)	-.215 (.309)	-.122 (.330)	-.157 (.298)	-.040
Job Demand	.006 (.007)	.006 (.006)	.001 (.007)	.002 (.006)	.031
CONSC	-.066** (.019)	-.032 [†] (.018)	-.055** (.018)	-.023 (.018)	-.109
NEURO		.080*** (.015)	- (.015)	.078*** (.015)	.427***
WLCS			-.043** (.014)	-.039** (.012)	-.252**
<i>F</i> value	3.567**	8.989***	5.029***	9.756***	
Sig. <i>F</i> Change	.001	.000	.002	.000	
<i>R</i> ²	.108	.278	.177	.335	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 29⁺, the significance of the *F* change is from model 1⁺.

For model 33⁺, the significance of the *F* change is from model 29⁺.

Transformed dependent variable EE⁺ = SQRT (EE).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As predicted, conscientiousness and work locus of control were found to be negatively related to emotional exhaustion with unstandardized coefficients of $B = -.066$, $p = .001$ (model 29⁺) and $B = .090$, $p = .000$ (model 31⁺), respectively. The increase in the squared partial correlations R^2 of .095 for conscientiousness and .101 for work locus of control indicate a moderate effect size for both variables. Hypotheses 24 and 32 are supported. Neuroticism was found to be positively related to emotional exhaustion. The unstandardized coefficient for the NEURO term in model 30⁺ was $B =$

.090, $p = .000$, giving support for Hypothesis 28. The increase in the squared partial correlation R^2 of .247 indicates a large effect size.

Conscientiousness was found to be significantly related to emotional exhaustion when both neuroticism and work locus of control were individually controlled for, but not when both were entered into the equation (model 34⁺, $p = .192$). Neuroticism and work locus of control were both significantly related to emotional exhaustion in this model with unstandardized terms for $B = .078$, $p = .000$ and $B = -.039$, $p = .002$, respectively. Model 34⁺ had an F value of 9.756, $p = .000$ and an R^2 value of .335. The adjusted R^2 was .301. The beta coefficients for the NEURO and WLCS terms are shown in table 5.7. The advantage of beta coefficients is that they reflect the relative impact on the dependent variable of a change of one standard deviation of the independent variables (Hair et al., 2006: 226). The relative importance of conscientiousness (nonsignificant), neuroticism ($\beta = .427$, $p = .000$) and work locus of control ($\beta = -.252$, $p = .002$) are readily assessed. The results indicate that neuroticism has a much larger, and opposite, affect on emotional exhaustion than work locus of control.

Inspection of the P-P plot and the scatterplot of regression standardized residuals (see figures A-5.1 and A-5.2, respectively, in appendix 5.2) showed no violations of assumptions. The maximum value of Cook's distance and value of $DFBETA$ in these analyses were .051 and .120, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients.

Analysis 5.2

The variables Job Demand and CONSC were found to be nonnormal in their distributions while NEURO and WLCS were found to be normal (see section 3.3.7). To assess the effect of the nonnormality of conscientiousness and job demand on the results the analysis was repeated with the transformed variables $JD^+ = \text{LOG}(JD)$ and $CONSC^+ = \text{SQRT}(k - \text{CONSC})$ in place of the untransformed variables. The results were not materially different from those of analysis 5.1. For example, the F value for model 29⁺⁺ was 3.372, $p = .012$, which is very similar to that of model 29⁺ (F value of 3.567, $p = .009$). The value of R^2 for the two models was almost identical at .103 and .108, respectively. Once the reflect element of the CONSC term was allowed for the relationship was again found to be significant ($p = .001$, the same as previously) and negative. The models for neuroticism and work locus of control were not materially different. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of Cook's distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results.

Analysis 5.3

Analysis 5.1 was repeated for the untransformed dependent variable emotional exhaustion. The results are shown in table 5.4. As can be seen, the results are not materially different to those of analysis 5.1.

TABLE 5.4 Regression Analyses for Dependent Variable: Emotional Exhaustion (EE) and Independent Variables: Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 29	Model 32	Model 33	Model 34	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>Beta</i> (β)
Constant	14.955*** (.833)	14.481*** (.760)	14.697*** (.829)	14.805*** (.731)	
Gender	-2.407 (2.364)	-1.501 (2.151)	-.984 (2.352)	-1.251 (2.083)	.047
Tenure	-1.035 (2.627)	-1.019 (2.396)	.043 (2.612)	-.822 (2.305)	-.027
Job Demand	.064 (.052)	.075 (.047)	.034 (.053)	.039 (.046)	.066
CONSC	-.491** (.144)	- -	- -	-.167 (.137)	-.101
NEURO		.678*** (.111)	- -	.588*** (.114)	.421***
WLCS			-.376** (.106)	-.292** (.095)	-.246**
<i>F</i> value	3.539**	10.071***	3.802**	9.383***	
Sig. <i>F</i> Change	.001	.000	.001	.000	
<i>R</i> ²	.107	.255	.114	.327	

Notes: *n* = 128; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For all models, the significance of the *F* change is from model 1, the base model.

† *p* < .1; * *p* < .05; ** *p* < .01; and *** *p* < .001.

Analysis 5.4

To test Hypotheses 36, 37 and 38 product terms for each of the personality measures of CONSC, NEURO and WLCS and job demand were added to models 29⁺, 30⁺ and 31⁺ to give models 35⁺, 36⁺ and 37⁺, respectively. The results are shown in table 5.5. The coefficients of the product terms CONSC x JD and NEURO x JD were

nonsignificant ($p = .318$ and $p = .184$, respectively), indicating that neither conscientiousness nor neuroticism interact with job demand in the prediction of emotional exhaustion. The product term WLCS x JD had a significant coefficient ($p = .066$), indicating an interaction between work locus of control and job demand in the prediction of emotional exhaustion. The increase in the squared partial correlation R^2 between models 31⁺ and 37⁺ was .028. Inspection of the P-P plot and the scatterplot of regression standardized residuals for models 35⁺, 36⁺ and 37⁺ indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results. The maximum values for model 37⁺, which included the product term WLCS x JD for the variance inflation factor, Cooke's distance, standardized residuals and *DFBETA* value were 1.09, .138, -2.72 and -.007, respectively.

Analysis 5.5

Cohen et al. (2003: 299) identify that a form of specification error of a model that can result in a significant product term coefficient B_3 giving a false result that is of particular concern, is when equation 5.1 is specified when the correct equation may be that shown in equation 5.2. This arises when X and Z are correlated, as the X^2 and Z^2 terms will be correlated with XZ . In this case WLCS and JD were found to be correlated with a standardized coefficient of $\beta = -.22$, $p = .016$. The quadratic term for WLCS was added to model 33⁺ and was found to be nonsignificant ($p = .750$). This indicates that the significant unstandardized coefficient for the product term WLCS x JD is not due to a misspecification of the model.

$$\hat{Y} = B_1X + B_2Z + B_3XZ + B_0 \quad (\text{Equation 5.1})$$

$$\hat{Y} = B_1X + B_2Z + B_3X^2 + B_0 \quad (\text{Equation 5.2})$$

Analysis 5.6

To confirm that the results were not affected by the lack of normality of the independent variables CONSC and JD the analysis was repeated with the transformed independent variables $JD^+ = \text{LOG}(JD)$ and $CONSC^+ = \text{SQRT}(k - \text{CONSC})$. The lack of interaction between conscientiousness and neuroticism with job demand were confirmed with the coefficients of the product terms again being nonsignificant ($p = .318$ and $p = .184$, respectively). The interaction between job demand and work locus of control in the prediction of emotional exhaustion was confirmed with the coefficient of the product term found to be significant ($p = .074$). Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violations of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances, standardized residuals and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results.

TABLE 5.5 Regression Analyses for Dependent Variable Emotional Exhaustion (EE⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 35 ⁺	Model 36 ⁺	Model 37 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	3.707*** (.108)	3.700*** (.098)	3.655*** (.107)
Gender	-.381 (.308)	-.242 (.278)	-.204 (.304)
Tenure	-.182 (.341)	-.195 (.310)	-.120 (.339)
Job Demand	.005 (.007)	.007 (.006)	.002 (.007)
CONSC	-.062** (.019)	- -	- -
CONSC x JD	-.011 (.001)	- -	- -
NEURO		.088*** (.014)	- -
NEURO x JD		.001 (.001)	- -
WLCS			-.046** (.014)
WLCS x JD			-.002 [†] (.001)
<i>F</i> value	3.055*	8.628***	3.781**
Sig. <i>F</i> Change	.318	.184	.066
<i>R</i> ²	.115	.269	.139

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For model 35⁺, the significance of the *F* change is from model 29⁺. For model 36⁺, the significance of the *F* change is from model 30⁺. For model 37⁺, the significance of the *F* change is from model 31⁺.

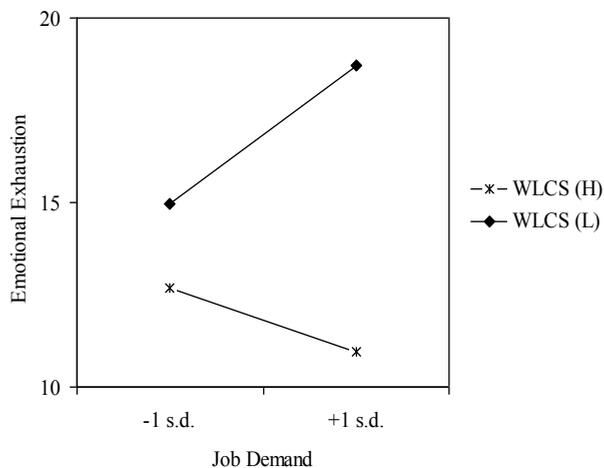
[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 5.7

Analysis 5.4 was repeated for the untransformed dependent variable emotional exhaustion. The results were consistent with those of analysis 5.5 and 5.6. The unstandardized coefficient for the product term $WLCS \times JD$ was $B = -.013, p = .046$.

Following the methods described by Aiken and West (1991: 12) the values predicted for emotional exhaustion from the equation in model 37 for values of $WLCS_H$ and $WLCS_L$ (corresponding to values of ± 1.0 standard deviation), for females (value = 0), tenure greater than 3 months (value = 0) for ± 1.0 standard deviation for mean-centered JD were plotted (see figure 5.1).

FIGURE 5.1 Interaction between Job Demand and Work Locus of Control Predicting Emotional Exhaustion



To confirm the equations and to conduct *t*-tests to investigate whether the slopes were significantly different to zero, the computer procedure described by Aiken and West (1991: 18) was followed. A simple slope regression analysis was conducted one standard deviation above and below the mean value by creating conditional values of Z (CV_Z), which refer to the specific value of Z at which the regression of Y on X is considered for equation 3.2 (see section 3.3.3) and is generalized to the respective equations in this analysis. In figure 5.1 the slope for $WLCS_L$ was found to be significantly different from zero ($p = .072$). The slope for $WLCS_H$ was not found to be significantly different ($p = .442$). This suggests that, in this study, an increase in job demand is only related to an increase in emotional exhaustion for external individuals. As expected the value of emotional exhaustion is higher for external individuals than internal individuals and an increase in job demand is only associated with an increase in emotional exhaustion of external individuals. Although not significant, it is interesting

that the slope for high WLCS is downward as this may indicate that as job demand increase internals become activated and derive a sense of meaning from their roles.

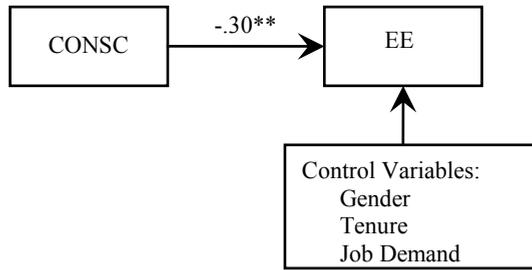
5.3.3 Summary of Results for Dependent Variable Emotional Exhaustion

In this study conscientiousness and internality of work locus of control were found to be negatively related to emotional exhaustion with a moderate effect size. Hypotheses 24 and 32 are supported. That is, individuals with high levels of conscientiousness are likely to experience lower levels of emotional exhaustion than those with low levels of conscientiousness. Similarly internal individuals (high work locus of control) are likely to experience lower levels of emotional exhaustion than individuals with an external (low) work locus of control. The relationship between neuroticism and emotional exhaustion is positive with a large effect size. That is, neurotic individuals are likely to experience higher levels of emotional exhaustion than emotionally stable individuals. Hypothesis 28 is supported. Conscientiousness was significantly related to emotional exhaustion when the effects of work locus of control or neuroticism were partialled out, but not when both were included. When all three personality variables were included in the equation the R^2 value was .335 and the adjusted R^2 value was .301.

Job demand and emotional exhaustion were found to be positively related and there was evidence of a significantly interaction effect of work locus of control and job demand in the prediction of emotional exhaustion. The results suggest that job demand will be associated with an increase in emotional exhaustion for external but not internal individuals. No evidence for an interaction between either conscientiousness nor neuroticism and job demand in the prediction of emotional exhaustion was found. Hypothesis 38 is supported, but Hypotheses 36 and 37 are not.

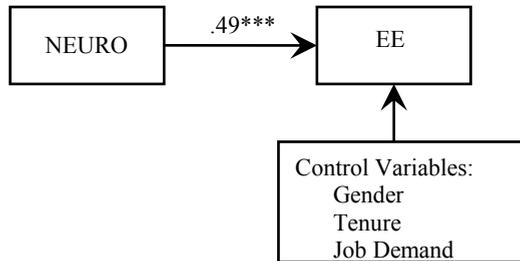
To allow the comparison of effects of variables on the dependent variable across studies it is recommended that the standardized coefficient (β) is reported (Cohen et al., 2003: 154). However, for interaction terms, unstandardized coefficients (B) are reported as standardized coefficients for interaction terms are not properly standardized, and are therefore uninterpretable (Aiken & West, 1991; Frazier et al., 2004). The results are summarized in figures 5.2, 5.3 and 5.4.

FIGURE 5.2 Relationship between Conscientiousness and Emotional Exhaustion



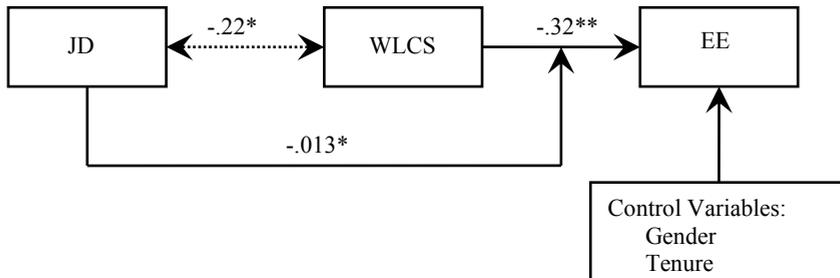
Notes: Standardized coefficients are shown.
[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 5.3 Relationship between Neuroticism and Emotional Exhaustion



Notes: Standardized coefficients are shown.
[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 5.4 Relationships between Work Locus of Control, Job Demand and Emotional Exhaustion



Notes: Standardized coefficients are shown; except for interaction terms were unstandardized coefficients are shown to prevent misinterpretation of the results and for the relationship between JD and WLCS, where the Pearson Correlation r value is shown.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

5.3.4 Analysis of Dependent Variable Depersonalization

Depersonalization was found to be nonnormal, but a successful transformation to normalize the scores was not found (see section 3.3.7). In analysis 5.8 the regression analysis was conducted for the untransformed depersonalization scores. In analysis 5.9, the analysis was repeated with an identified outlier removed. In analysis 5.10, to minimize lack of normality and heteroscedasticity in the regression residuals, the analysis was conducted with the transformed independent variables $JD^+ = \text{LOG}(JD)$, $LMX^+ = \text{SQRT}(k - LMX)$ and $CF^+ = \text{LOG}(CF)$ (see section 3.3.7) and, as previously, the technique described by Cohen et al., (2003: 238) was used of including a constructed variable (W_i) in the regression equation to predict a value of λ for use in a Box Cox transformation of $DEP^{(\lambda)}$. The outlier was removed for this analysis. In analysis 5.11, a Spearman Rank Order Correlation was conducted (as this is the non-parametric alternative to Pearson's product-moment correlation) to calculate the strength of the relationship between the variables. In analysis 5.12, a logistic regression analysis was conducted having categorized the depersonalization scores into two categories of *no* report of depersonalization and *some level* of depersonalization.

Analysis 5.8

To determine the individual relationships with depersonalization and to test Hypotheses 25, 29 and 33 each of the variables CONSC, NEURO and WLCS were added separately to the base model (model 8) to give models 38, 39, and 40, respectively. To confirm the relationships when controlling for the other two independent personality variables and to compare the relative effects of each of the three personality traits on depersonalization, the WLCS term was added to model 39 to give model 41, and subsequently the CONSC term was added to give model 42. As expected, inspection of the P-P plot showed a departure from normality of the distribution of the residuals (see figure A-5.3 in appendix 5.2) and some violation of assumptions. Inspection of the scatterplot of regression standardized residuals (see figure A-5.4 in appendix 5.2) indicated a level of heteroscedasticity. Some caution is therefore required when interpreting the results below.

Conscientiousness and work locus of control were found to be negatively related to depersonalization ($B = -.124, p = .004$ and $B = -.106, p = .001$, respectively) whilst neuroticism was found to be positively related ($B = .082, p = .027$). Tenure was found to be significantly related to emotional exhaustion ($p = .055$). A potential outlier was identified with a *DFBETA* value above the cut-off value of 1.0 at 1.05. This case had previously been identified as a potential outlier for DEP with a z value of 5.26 (reference section 3.3.6). Although no reason was found to remove this case, the analysis was repeated with the case removed to assess any possible impact on the results.

Analysis 5.9

The maximum Cook's distance and value of *DFBETA* in this analysis were .265 and .771, respectively, suggesting no case now had high influence on the overall equation or any of the individual coefficients. The results from the regression analysis are shown in tables 5.6 and 5.7.

TABLE 5.6 Regression Analyses for Dependent Variable Depersonalization (DEP) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS (Outlier removed)

Variable	Model 8	Model 38	Model 39	Model 40
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	1.640 (.227)	1.669 (.222)	1.641 (.277)	1.615 (.221)
Gender	-.437 (.642)	-.593 (.629)	-.430 (.643)	-.291 (.626)
Tenure	.340 (.749)	.267 (.731)	.373 (.750)	.540 (.730)
Job Demand	-.001 (.014)	-.003 (.014)	-.001 (.014)	-.009 (.014)
CONSC		-.102** (.039)	- -	- -
NEURO			.030 (.035)	- -
WLCS				-.082** (.029)
<i>F</i> value	.256	1.957	.382	2.249 [†]
Sig. <i>F</i> Change	.857	.009	.384	.005
<i>R</i> ²	.006	.063	.013	.071

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 39 and 40, the significance of the *F* change is from model 8.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Conscientiousness and work locus of control were again found to be negatively related, with unstandardized coefficients of $B = -.102$, $p = .009$ and $B = -.082$, $p = .005$, respectively. The increase in the squared partial correlations R^2 of .057 and .069,

respectively, indicate a small effect size. Neuroticism was no longer found to be significantly related to depersonalization ($p = .384$). Conscientiousness and work locus of control were still found to be significantly negatively related to depersonalization when the other two personality variables were controlled for in model 40 ($p = .037$ and $p = .015$, respectively). The results indicated the similarity in relative importance between conscientiousness and work locus of control. The CONSC term had a standardized coefficient of $\beta = -.202$ compared to $\beta = -.226$ for the WLCS term.

TABLE 5.7 Regression Analyses for Dependent Variable Depersonalization (DEP) and Independent Variable Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS (Outlier removed)

Variable	Model 8	Model 39	Model 41	Model 42	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	Beta (β)
Constant	1.640 (.227)	1.641 (.277)	1.669 (.223)	1.643 (.218)	
Gender	-.437 (.642)	-.430 (.643)	-.594 (.633)	-.444 (.622)	-.064
Tenure	.340 (.749)	.373 (.750)	.266 (.736)	.450 (.724)	.056
Job Demand	-.001 (.014)	-.001 (.014)	-.003 (.014)	-.009 (.014)	-.059
CONSC		-	-.103* (.041)	-.087* (.041)	-.202*
NEURO		.030 (.035)	-.001 (.036)	-.002 (.036)	-.004
WLCS				-.071* (.029)	-.226*
<i>F</i> value	.256	.382	1.552	2.365*	
Sig. <i>F</i> Change	.857	.384	.014	.015	
<i>R</i> ²	.006	.013	.063	.110	

Notes: $n = 127$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 5.8 Regression Analyses for Transformed Dependent Variable Depersonalization (DEP⁺) and Mean-Centered Independent Variables Gender, Tenure, NEURO, WLCS and Mean-Centered Transformed Variables JD⁺ and CONSC⁺ (Outlier removed)

Variable	Model 8 ⁺⁺	Model 38 ⁺⁺	Model 39 ⁺⁺	Model 40 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	-.045 (.182)	-.021 (.177)	-.044 (.182)	-.066 (.176)
Gender	-.204 (.515)	-.323 (.503)	-.197 (.514)	-.082 (.500)
Tenure	.118 (.600)	.039 (.584)	.153 (.599)	.284 (.583)
Job Demand ⁺	.435 (3.097)	.383 (3.014)	.642 (3.097)	-1.274 (3.053)
CONSC ⁺		.474** (.172)	-	-
NEURO			.033 (.028)	-
WLCS				-.068** (.023)
<i>F</i> value	.256	1.962	.401	2.276 [†]
Sig. <i>F</i> Change	.973	.007	.243	.004
<i>R</i> ²	.002	.063	.014	.072

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 39⁺⁺ and 40⁺⁺, the significance of the *F* change is from model 8⁺⁺.

Transformed dependent variable $DEP^{(\lambda)} = (DEP^\lambda - 1) / \lambda$, where $\lambda = .570$

Transformed dependent variables $JD^+ = \text{LOG}(JD)$ and $CONSC^+ = \text{SQRT}(k - \text{CONSC})$.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 5.9 Regression Analyses for Transformed Dependent Variable Depersonalization (DEP⁺) and Mean-Centered Independent Variables Gender, Tenure, NEURO, WLCS and Mean-Centered Transformed Variables JD⁺ and CONSC⁺ (Outlier removed)

Variable	Model 8 ⁺⁺	Model 42 ⁺⁺	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	Beta (<i>β</i>)
Constant	-.045 (.182)	-.043 (.174)	
Gender	-.204 (.514)	-.193 (.496)	-.035
Tenure	.118 (.600)	.203 (.578)	.031
JD ⁺	.435 (3.097)	-1.039 (3.017)	-.031
CONSC ⁺		.382* (.183)	.200*
NEURO		.006 (.029)	.020
WLCS		-.059* (.023)	-.234*
<i>F</i> value	.076	2.459*	
Sig. <i>F</i> Change	.973	.003	
<i>R</i> ²	.002	.114	

Notes: $n = 127$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the F value, the significance refers to the change in the F value between models.

Transformed dependent variable $DEP^{(\lambda)} = (DEP^\lambda - 1) / \lambda$, where $\lambda = .570$

Transformed dependent variables $JD^+ = \text{LOG}(JD)$ and $CONSC^+ = \text{SQRT}(k - \text{CONSC})$.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 5.10

To minimize lack of normality and heteroscedasticity in the regression residuals analysis 5.9 was repeated for the transformed independent variables $JD^+ = \text{LOG}(JD)$ and $CONSC^+ = \text{SQRT}(k - \text{CONSC})$ and a Box Cox transformation of $DEP^{(\lambda)}$ (see section 3.3.7). The optimum solution found for λ was .570. The P-P plot and the scatterplot of regression standardized residuals with this transformation indicated an improvement (see figures A-5.5 and A-5.6 in appendix 5.2). The P-P plot did not indicate a serious

violation of the assumption of nonnormality. Some level of heteroscedasticity was still indicated in the scatterplot. Reliance is placed on the comment of Tabachnick and Fidell (2007: 127) that although heteroscedasticity weakens an analysis, it does not invalidate it. The results are shown in tables 5.8 and 5.9. As can be seen the findings of analysis 5.9 were not materially changed. The significance of the coefficients for the CONSC and WLCS terms were almost identical ($p = .007$ and $p = .004$, respectively, compared to $p = .009$ and $p = .005$, previously). The increase in the squared partial correlations R^2 for conscientiousness and work locus of control were not materially changed, and again indicated a small effect size. Neuroticism was again not found to be significantly related to depersonalization ($p = .243$).

Analysis 5.11

To calculate the strength of the relationship between the variables a Spearman Rank Order Correlation was conducted, which is the non-parametric alternative to Pearson's product-moment correlation. The results are shown in table 5.10. None of the control variables were found to be significantly related to depersonalization. Conscientiousness and work locus of control were confirmed as negatively correlated to depersonalization with $\rho = -.265$, $p = .003$ and $\rho = -.262$, $p = .003$, respectively. Neuroticism was found to be positively related to depersonalization ($\rho = .166$, $p = .066$).

TABLE 5.10 Nonparametric Correlation Spearman's Rho for Gender, Tenure, Job Demand, Conscientiousness, Neuroticism, Work Locus of Control and Depersonalization

Variable	1	2	3	4	5	6
1. Gender	-					
2. Tenure	-.112	-				
3. Job Demand	-.018	.003	-			
4. Conscientiousness	-.109	-.084	-.001	-		
5. Neuroticism	.020	-.018	-.013	-.359***	-	
6. Work Locus of Control	.087	.007	-.136	.141	-.085	-
7. Depersonalization	-.033	.055	.029	-.265**	.166 [†]	-.262**

Tests of significance were two-tailed. $n = 128$. [†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 5.12

As previously, (see chapter 4), a logistic regression analysis was conducted for depersonalization coded into two categories of no depersonalization reported (41.4%) and some level of depersonalization reported (55.5%). The control variables were again entered in block 1 to give model 12. In the next step the NEURO term was added to give model 43. The CONSC term was added in the third step to give model 44. The WLCS term was added in the final step to give model 45. The results are shown in table 5.11.

TABLE 5.11 Logistic Regression Analysis for Dependent Variable Depersonalization and Independent Variables Gender, Tenure, JD, CONSC, NEURO and WLCS

Variable	Model 12	Model 43	Model 44	Model 45
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	-.065 (1.611)	-.974 (1.745)	4.027 (2.640)	8.611* (3.409)
Gender	.298 (.594)	.312 (.599)	.138 (.625)	.340 (.667)
Tenure	-.103 (.639)	-.138 (.652)	-.283 (.669)	-.190 (.697)
Job Demand	.003 (.013)	.003 (.013)	.003 (.014)	-.004 (.015)
NEURO		.046 (.031)	.012 (.034)	.012 (.035)
CONSC			-.114* (.044)	-.105* (.046)
WLCS				-.069* (.030)
Omnibus test of Step Sig.	.949	.126	.007	.018
Hosmer-Lemeshow Test (Sig.)	.429	.869	.819	.505
Cox & Snell <i>R</i> ²	.003	.022	.078	.119
Nagelkerke <i>R</i> ²	.004	.029	.105	.159

Notes: A value of $p > 0.05$ for the Hosmer-Lemeshow Test indicates support for the model.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

In model 43 the Omnibus test of step 2 was nonsignificant ($p = .126$) and from the Wald Test the NEURO term was found not to contribute significantly to the model ($p =$

.132). Adding the CONSC term in step 3 was found to be significant (Omnibus test $p = .007$). The CONSC term was found to contribute significantly to the predictive ability of the model with a coefficient of $B = -.114$, $p = .011$. The negative coefficient for CONSC suggests that the higher the value of CONSC the less likely it is that the individual will report experiencing depersonalization. For a model with only the control variables and the CONSC term the Cox & Snell R square and Nagelkerke R square were .077 and .103, respectively, suggesting that between 7.7% and 10.3% of the variability is explained by the CONSC term.

The addition of the WLCS term in step 4 was also found to be significant (Omnibus test $p = .018$). From the Wald Test the WLCS term was found to contribute significantly to the predictive ability of the model with a coefficient of $B = -.069$, $p = .022$. The negative coefficient again suggests that the higher the value of WLCS the less likely it is that the individual will report experiencing depersonalization. In this model the CONSC term was still found to be have a significant coefficient ($B = -.105$, $p = .023$). For a model with only the control variables and the WLCS term the Cox & Snell R square and Nagelkerke R square were .065 and .087, respectively, suggesting that between 6.5% and 8.7% of the variability is explained by the WLCS term. There was no material difference to the results when the analysis was repeated with the potential outlier removed.

5.3.5 Summary of Results for Dependent Variable Depersonalization

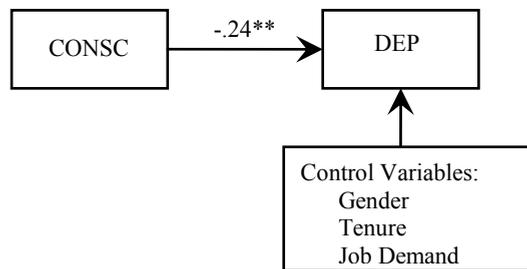
The results of analyses 5.8, 5.9, and 5.10 require some caution in their consideration and interpretation due to the evidence of some violation of underlying assumptions. However, the findings provide support that conscientiousness and work locus of control are negatively related to depersonalization with small effect sizes (increases in the squared partial correlation R^2 of .057 and .069, respectively). Both conscientiousness and work locus of control were found to significantly predict depersonalization when all three of the personality variables were included in the model.

For the case of neuroticism the advice of Hair et al. (2006: 76) is followed. As no reason was found to remove the case and it is not out of line with levels of depersonalization reported in other studies, it was decided to retain it in the analysis. However, their recommendation to be aware of instances where results would be substantially changed by deletion of a single or small number of cases (Hair et al., 2006: 222) is followed. It is noted that in this study neuroticism was found to be positively related to depersonalization, but only if one potentially outlying case is included in the analysis. The squared partial correlation R^2 of .041 indicates a small effect size.

When all three personality variables were included in the model the R^2 value was .110. The relative importance of conscientiousness vis-à-vis work locus of control is indicated by their respective standardized coefficients ($\beta = -.202$ and $\beta = -.226$, respectively).

Analyses 5.11 and 5.12 provided further support for the above findings, and again indicated significant and negative relationships between both conscientiousness and work locus of control and depersonalization. Neuroticism was found to be significantly related to depersonalization in analysis 5.11, but not in analysis 5.12. The effect sizes predicted from the logistic regression conducted in analysis 5.12 were similar to those of analysis 5.10 with between 7.7% and 10.3% of the variance explained by the CONSC term and between 6.5% and 8.7% of the variance explained by the WLCS term when each were added separately. The logistic regression analysis predicted that between 11.9% and 15.9% of the variance in depersonalization was explained by the three personality variables.

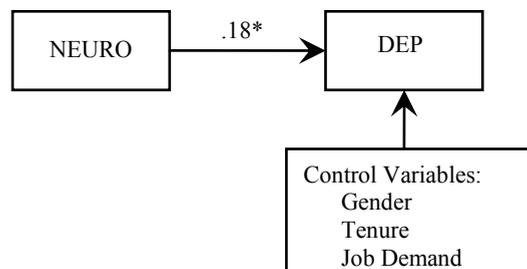
FIGURE 5.5 Relationship between Conscientiousness and Depersonalization



Notes: Standardized coefficients are shown.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

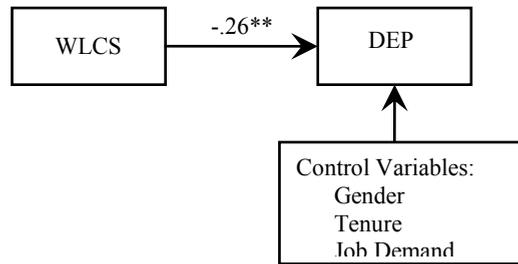
FIGURE 5.6 Relationship between Neuroticism and Depersonalization



Notes: Standardized coefficients are shown.

The relationship between NEURO and DEP is dependent on one outlying case. When this case was removed, the significance changed from $p = .042$ to $p = .245$.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 5.7 Relationship between Work Locus of Control and Depersonalization

Notes: Standardized coefficients are shown.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Hypotheses 25 and 33 are supported. There is some limited evidence that neuroticism is positively related to depersonalization, providing some support for Hypothesis 29. The results are summarized in figures 5.5, 5.6 and 5.7.

5.3.6 Analysis for Dependent Variable reduced Personal Accomplishment

As previously, (see section 4.3.6), it was decided to conduct the initial analysis with the transformed dependent variable $rPA^+ = rPA^\lambda$ (where, $\lambda = 0.7$); (see section 3.3.7). Analysis 5.13 is the initial analysis and investigated the relationship between each of the three personality trait variables with reduced personal accomplishment and their relative effects. In analysis 5.14, the effect of the nonnormality of the relevant independent variables on the results was checked. In analysis 5.15, the analysis was repeated for the untransformed dependent variable rPA , and the results were compared to those of analyses 5.13 and 5.14.

Analysis 5.13

Analysis 5.13 was conducted with the transformed dependent variable rPA^+ and the independent variables: gender, tenure, JD, CONSC, NEURO and WLCS. As previously, model 15⁺ included only the control variables. To determine the individual relationships with reduced personal accomplishment and to test Hypotheses 26, 30 and 34 each of the variables CONSC, NEURO and WLCS were added separately to this model to give models 46⁺, 47⁺ and 48⁺, respectively. To confirm the relationships when controlling for the other two independent personality variables and to compare the effects of each of the three personality traits on the dependent variable, the CONSC term was added to model 47⁺ to give model 49⁺ and the WLCS term was added to give model 50⁺. The results are shown in tables 5.12 and 5.13.

TABLE 5.12 Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 15 ⁺	Model 47 ⁺	Model 49 ⁺	Model 50 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	5.790*** (.290)	5.824*** (.285)	5.795*** (.285)	5.748*** (.274)
Gender	.685 (.820)	.504 (.808)	.706 (.808)	.931 (.778)
Tenure	.319 (.913)	.163 (.898)	.234 (.900)	.476 (.864)
Job Demand	.020 (.018)	.017 (.018)	.020 (.018)	.005 (.017)
CONSC		-.119* (.049)	- -	- -
NEURO			.091* (.042)	- -
WLCS				-.137*** (.035)
<i>F</i> value	.679	1.973	1.725	4.389 **
Sig. <i>F</i> Change	.566	.018	.030	.000
<i>R</i> ²	.017	.063	.055	.130

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the F value, the significance refers to the change in the F value between models.

For model 47⁺ and 48⁺, the significance of the F change is from model 15⁺.

Transformed dependent variable $rPA^+ = rPA^\lambda$, (where, $\lambda = 0.7$).

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As expected, conscientiousness and work locus of control were found to be negatively related to reduced personal accomplishment ($B = -.119, p = .018$ and $B = -.137, p = .000$, respectively), whilst neuroticism was found to be positively related ($B = .091, p = .030$). The effect of the addition of the CONSC and NEURO terms to model 15⁺ were found to have a small effect with increases of the squared partial correlations R^2 of .05 and .04, respectively. WLCS was found to have a moderate effect with an increase of the squared partial correlation R^2 of .12.

TABLE 5.13 Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 15 ⁺	Model 47 ⁺	Model 49 ⁺	Model 50 ⁺	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	Beta (β)
Constant	5.790*** (.290)	5.795*** (.285)	5.820*** (.283)	5.774*** (.271)	
Gender	.685 (.820)	.706 (.808)	.560 (.805)	.821 (.773)	.092
Tenure	.319 (.913)	.234 (.900)	.139 (.894)	.323 (.856)	.032
Job Demand	.020 (.018)	.020 (.018)	.018 (.018)	.005 (.017)	.027
CONSC		- (.053)	-.091 [†] (.053)	-.064 (.051)	.120
NEURO		.091* (.042)	.064 (.044)	.056 (.042)	-.116
WLCS				-.122** (.035)	-.309**
<i>F</i> value	.679	1.725	2.009 [†]	3.838**	
Sig. <i>F</i> Change	.566	.030	.085	.001	
<i>R</i> ²	.017	.055	.079	.166	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable $rPA^+ = rPA^\lambda$, (where, $\lambda = 0.7$).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

When the CONSC and NEURO terms were included in the equation, the coefficient for CONSC was significant ($B = -.091$, $p = .085$), but the coefficient for the NEURO term became nonsignificant ($p = .152$). The relative effects of each of the three personality variables on individuals' reduced personal accomplishment are indicated from the value of their respective standardized coefficients in model 50⁺. In this model only the WLCS term had a significant coefficient of $\beta = -.309$, $p = .001$.

Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions (see figures A-5.7 and A-5.8 in appendix 5.2). Inspection of Variance Inflation Factors (VIF), Cook's distances, standardized residuals

and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results (maximum values of 1.195, .106, 2.71 and .015).

Analysis 5.14

To check for the effects of the nonnormality of distribution of the variables of job demand and conscientiousness, analysis 5.13 was repeated for the transformed variables DEP^+ , JD^+ and $CONSC^+$ and compared the results between the two analyses. The results were not materially different. It is concluded that the nonnormality of the variables JD and $CONSC$ did not influence the results.

Analysis 5.15

The results for the analysis with the untransformed variable reduced personal accomplishment as the dependent variable are shown in table 5.14. As can be seen, the results were not materially different from those of analysis 5.14. For example, the R^2 value of model 50 was .152, while in model 50^+ it was .166. The F values for the two models were also very similar: $F = 3.461, p = .004$ and $F = 3.838, p = .002$ for models 50 and 50^+ , respectively. In model 50 the standardized coefficient for the WLCS term was $\beta = -.289, p = .002$, while in model 50^+ it was $\beta = -.309, p = .001$. No violation of assumptions was indicated from inspection of the normal probability plot and the scatterplot of the regression standardized residuals. Examination of relevant statistics indicated no concerns of multicollinearity or effects from outliers.

5.3.7 Summary of Results for Dependent Variable reduced Personal Accomplishment

The results of this section support a negative relationship between both conscientiousness and work locus of control in the prediction of reduced personal accomplishment with small and moderate effect sizes, respectively (increases in the squared partial correlations R^2 of .040 and .100, respectively). Hypotheses 26 and 34 are supported. Neuroticism was found to be negatively related to reduced personal accomplishment with a small effect size (the increase in the squared partial correlation R^2 was .035). Hypothesis 30 is supported. Conscientiousness was significantly related to reduced personal accomplishment when neuroticism was controlled for, but not when work locus of control was controlled for. Neuroticism was not significantly related to reduced personal accomplishment when the effects of either conscientiousness or work locus of control were partialled out. The relationship between work locus of control and reduced personal accomplishment was significant when the conscientiousness and neuroticism were controlled for. The relative importance of work locus of control compared to conscientiousness and neuroticism is indicated by the effect size on reduced personal accomplishment and the value of the WLCS term standard coefficient

TABLE 5.14 Regression Analyses for Dependent Variable reduced Personal Accomplishment (rPA) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 15	Model 46	Model 47	Model 48	Model 50	
	<i>B</i> (<i>s.e.</i>)	<i>Beta</i> (β)				
Constant	13.163*** (.883)	13.260*** (.869)	13.178*** (.871)	13.043*** (.841)	13.116*** (.834)	
Gender	2.547 (2.497)	2.038 (2.467)	2.609 (2.463)	3.248 (2.386)	2.945 (2.379)	.108
Tenure	1.068 (2.779)	.627 (2.741)	.822 (2.743)	1.515 (2.649)	1.083 (2.633)	.036
Job Demand	.067 (.055)	.059 (.054)	.067 (.054)	.024 (.053)	.025 (.053)	.041
CONSC		-.335* (.151)	- -	- -	-.176 (.157)	.105
NEURO			.264* (.127)	- -	.165 (.131)	-.116
WLCS				-.390*** (.107)	-.349** (.109)	-.289**
<i>F</i> value	.883	1.916	1.758	4.029**	3.461**	
Sig. <i>F</i> Change	.452	.028	.040	.000	.119	
<i>R</i> ²	.022	.061	.056	.120	.152	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

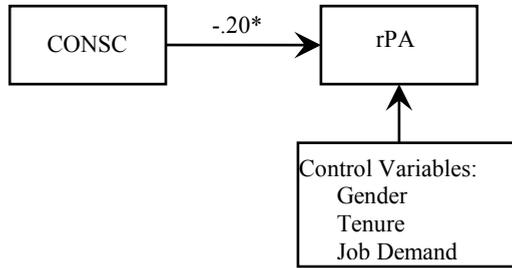
For the *F* value, the significance refers to the change in the *F* value between models.

For model 47 and 48, the significance of the *F* change is from model 15.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

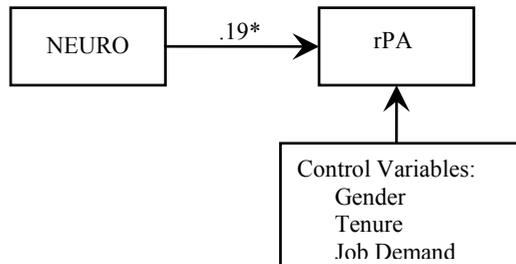
in model 50 of $\beta = -.289$, $p = .002$ This compares to the coefficients of the other two terms (CONSC and NEURO), which were both nonsignificant ($p = .210$ and $p = .214$, respectively). When all three personality variables were included in the equation, the R^2 value was .152 and the adjusted R^2 value was .108. The results are summarized in figures 5.8, 5.9, and 5.10.

FIGURE 5.8 Relationship between Conscientiousness and reduced Personal Accomplishment



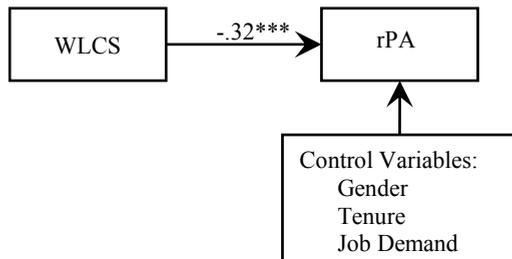
Notes: Standardized coefficients are shown.
† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 5.9 Relationship between Neuroticism and reduced Personal Accomplishment



Notes: Standardized coefficients are shown.
† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 5.10 Relationship between Work Locus of Control and reduced Personal Accomplishment



Notes: Standardized coefficients are shown.
† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

5.3.8 Analysis for Dependent Variable Unidimensional Measure of Burnout

The unidimensional measure of burnout (MBI) was found to be normal in distribution (see section 3.3.7). Analysis 5.16 was the initial analysis for the dependent variable MBI and the independent variables gender, tenure, JD, CONSC, NEURO and WLCS. In this analysis the individual relationships of conscientiousness, neuroticism and work locus of control with burnout and their relative importance was investigated, and Hypotheses 27, 31, and 35 were tested. In analysis 5.17, the presence of interaction effects between job demand and the three personality variables in the prediction of MBI were investigated, and Hypotheses 39, 40, and 41 were tested. In analysis 5.18, post hoc probing of the significant interactions was conducted.

Analysis 5.16

The analysis started with model 20 which included gender, tenure and job demand in the prediction of burnout. To test Hypotheses 27, 31 and 35 the CONSC, NEURO and WLCS terms were individually added to this model to give models 51, 52 and 53, respectively. To determine the relative importance of the three personality variables all three terms were included in model 54. The results are shown in table 5.15.

As predicted, conscientiousness was found to be negatively related to burnout with an unstandardized coefficient of $B = -.950$, $p = .000$ (model 51). Previously, a possible outlier had been identified for CONSC with a z value of 3.92 (see section 3.3.6), which is above the limit of 3.29 recommended by Tabachnick and Fidell (2007: 75). Although not shown, the unstandardized coefficient for the CONSC term was not materially changed with the potential outlier removed ($B = -.887$, $p = .001$). Further, an investigation into possible effects of the nonnormality of the CONSC variable through the use of the transformed term $CONSC^+$ (see section 3.3.7) again resulted in a significant coefficient ($B = 5.131$, $p = .000$), which indicates a negative relationship with burnout once the reflect element of the transformation is considered. The R^2 value was .138 for the transformed $CONSC^+$ term, which is similar to that for the untransformed term of $R^2 = .145$.

Neuroticism was found to be positively related to burnout with an unstandardized coefficient for the NEURO term in model 52 of $B = 1.024$, $p = .000$. Work locus of control was found to be negatively related to burnout with an unstandardized coefficient for the WLCS term in model 53 of $B = -.873$, $p = .000$. The increase in the squared partial correlations of $R^2 = .198$ when the NEURO term, and $R^2 = .188$ when the WLCS term, were each separately added to model 20 indicates that neuroticism and work locus of control both have a large effect size on burnout. The increase in the squared partial correlation for the CONSC term of $R^2 = .121$ indicates a moderate effect size. Hypotheses 27, 31 and 35 are supported.

TABLE 5.15 Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 20	Model 51	Model 52	Model 53	Model 54	
	<i>B</i> (<i>s.e.</i>)	Beta (β)				
Constant	29.617*** (1.442)	29.894*** (1.360)	29.675*** (1.297)	29.349*** (1.306)	29.562*** (1.166)	
Gender	.419 (4.081)	-1.028 (3.859)	.657 (3.670)	1.986 (3.705)	1.271 (3.325)	.028
Tenure	2.217 (4.541)	.964 (4.287)	1.263 (4.088)	3.216 (4.114)	1.751 (3.680)	.035
Job Demand	.158 [†] (.089)	.136 (.084)	.157 [†] (.080)	.063 (.083)	.068 (.074)	.068
CONSC		-.950*** (.236)	- -	- -	-.425 [†] (.219)	-.155 [†]
NEURO			1.024*** (.111)	- -	.798*** (.182)	.342***
WLCS				-.873*** (.167)	-.732*** (.152)	-.369***
<i>F</i> value	1.112	4.999**	8.310***	7.854***	12.022***	
Sig. <i>F</i> Change	.347	.000	.000	.000	.000	
<i>R</i> ²	.027	.145	.220	.210	.383	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For model 52, 53 and 54, the significance of the *F* change is from model 20.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Model 54 had an *F* value of 12.022, $p = .000$ and an R^2 value of .383. The adjusted R^2 was .352. The coefficients for all of the three terms in this model were significant. The relative importance of each is readily assessed through consideration of the standardized coefficients. These were $\beta = -.369$, $p = .000$ for work locus of control, $\beta = .342$, $p = .000$ for neuroticism, and $\beta = -.155$, $p = .055$ for conscientiousness.

Inspection of the P-P plot and the scatterplot of regression standardized residuals for each model showed no violations of assumptions (see figures A-5.9 and A-5.10 in appendix 5.2). One case was identified from inspection of the standardized residuals as being a potential outlier with a value of 3.71, which is above the guide value of ± 3.3 . The analysis was repeated with the case removed. No material change in the results was

observed except for a slight increase in the values of each of the coefficients for the three personality terms, and an increase in the value of R^2 from .383 to .450 and the adjusted R^2 from .352 to .421. As no reason was found to remove the case, the results with it included are reported.

Analysis 5.17

To test Hypotheses 39, 40, and 41, product terms for each of the personality measures of CONSC, NEURO and WLCS and job demand were added to models 51, 52 and 53, respectively, to give models 55, 56, and 57. The results are shown in table 5.16.

The coefficients of the product terms CONSC x JD and NEURO x JD were found to have significant coefficients ($B = -.040$, $p = .024$ and $B = .029$, $p = .010$, respectively), indicating that both conscientiousness and neuroticism interacted with job demand in the prediction of burnout as measured by the unidimensional measure. The investigation of the effects of the nonnormality of the variables CONSC and JD, through repeating the analysis using the transformed variables $CONSC^+$ and JD^+ , indicated no material effect on the results. The $CONSC^+ \times JD^+$ and $NEURO \times JD^+$ terms again both had significant coefficients ($p = .017$ and $p = .051$, respectively). The product term $WLCS \times JD$ had a nonsignificant coefficient ($p = .108$). In the investigation using the transformed variable JD^+ , the product term $WLCS \times JD^+$ again had a nonsignificant coefficient ($p = .145$). These results indicate that work locus of control and job demand did not interact in the prediction of burnout as measured by the unidimensional measure. Inspection of the P-P plot and the scatterplot of regression standardized residuals for each model showed no violations of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances, and values of standardized residuals and $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results (maximum values of 1.073, -2.42, .330 and -.085, respectively).

Analysis 5.18

The methods described by Aiken and West (1991: 18) were followed to conduct a simple slope regression analysis one standard deviation above and below the mean value by creating conditional values of $Z (CV_Z)$, which refer to the specific value of Z at which the regression of Y on X is considered for equation 3.2 (see section 3.3.3) and is generalized to the respective equations in this analysis. The plots for the CONSC x JD and NEURO x JD interactions are shown in figures 5.11 and 5.12, respectively.

In figure 5.11, the slope for $CONSC_L$ was found to be significantly different from zero ($p = .006$), while the slope for $CONSC_H$ was not ($p = .631$). This suggests that an increase in job demand is only associated with an increase in burnout when conscientiousness is low. As expected, burnout is lower for all levels of job demand for the case of high conscientiousness compared to that of low conscientiousness and, as job

TABLE 5.16 Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 51	Model 55	Model 52	Model 56	Model 53	Model 57
	<i>B</i> (<i>s.e.</i>)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)
Constant	29.894*** (1.360)	29.771*** (1.337)	29.675*** (1.297)	29.728 (1.266)	29.349*** (1.306)	29.116*** (1.305)
Gender	-1.028 (3.859)	-1.735 (3.804)	.657 (3.670)	.439 (3.582)	1.986 (3.705)	1.571 (3.688)
Tenure	.964 (4.287)	1.073 (4.213)	1.263 (4.088)	.934 (3.991)	3.216 (4.114)	2.382 (4.118)
Job Demand	.136 (.084)	.128 (.083)	.157 [†] (.080)	.153 [†] (.079)	.063 (.083)	.065 (.082)
CONSC	-.950*** (.236)	-.822** (.238)	- -	- -	- -	- -
CONSC x JD		-.040* (.017)	- -	- -	- -	- -
NEURO			1.024*** (.111)	.973*** (.186)	- -	- -
NEURO x JD				.029* (.011)	- -	- -
WLCS					-.873*** (.167)	-.827*** (.168)
WLCS x JD						-.016 (.010)
<i>F</i> value	4.999**	5.189***	8.310***	8.370***	7.854***	6.893***
Sig. <i>F</i> Change	.000	.024	.000	.000	.000	.108
<i>R</i> ²	.145	.182	.220	.263	.210	.228

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 51, 52 and 53, the significance of the *F* change is from model 20.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

demand increases, the level of burnout increases steeply for the case of low conscientiousness. In figure 5.12, the slope for NEURO_H was found to be significantly different from zero ($p = .001$), while the slope for NEURO_L was not ($p = .892$). This

indicates that an increase in job demand is only associated with an increase in burnout when neuroticism is high. As predicted, at all levels of job demand the level of burnout is higher for the case of high neuroticism compared to that of low neuroticism and the level of burnout is seen to increase steeply as job demand increases for the case of high neuroticism.

FIGURE 5.11 Interaction between Job Demand and Conscientiousness Predicting Burnout (MBI)

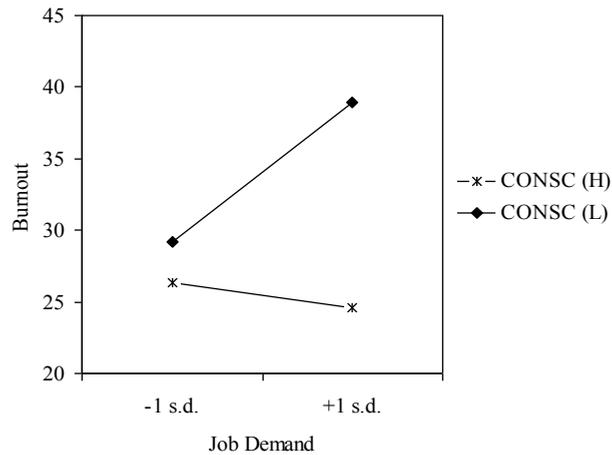
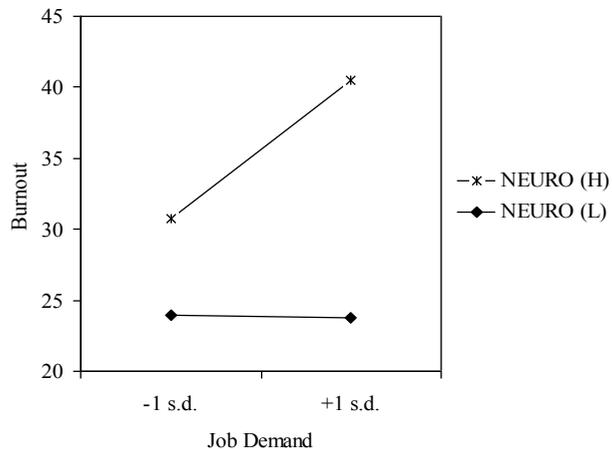


FIGURE 5.12 Interaction between Job Demand and Neuroticism Predicting Burnout (MBI)

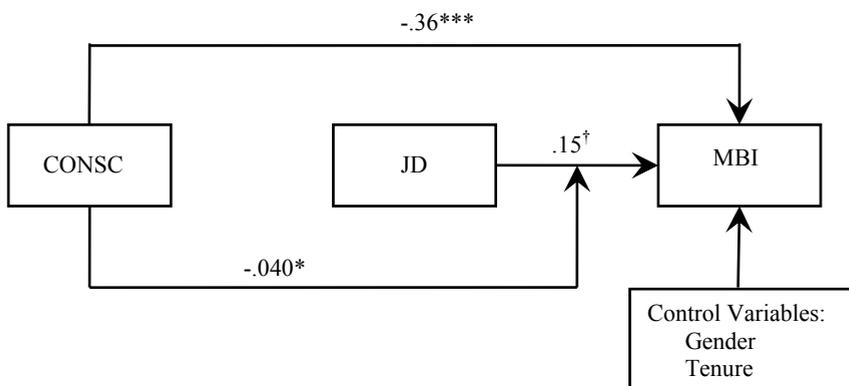


5.3.9 Summary of Results for Dependent Variable Unidimensional Measure of Burnout

As predicted, all three personality traits were found to be significantly related to burnout. Conscientiousness and work locus of control were found to be negatively and neuroticism positively related. The effect sizes for work locus of control and neuroticism were large (the increases in the squared partial correlations R^2 were .188 and .198, respectively), while that for conscientiousness was moderate (the increase in the squared partial correlation R^2 was .121). Hypothesis 36, 37 and 38 are supported. When all three personality variables were included in the equation, the relationships between each of the personality variables and burnout were still found to be significant. When all three personality variables were included in the equation, the R^2 value was .383 and the adjusted R^2 value was .352.

Both conscientiousness and neuroticism were found to have a significant interaction with job demand in the prediction of burnout. When conscientiousness was low, then an increase in job demand was associated with a steep increase in burnout. This was not the case for high conscientiousness, where the slope was not found to be significantly different from zero. When neuroticism was high, then an increase in job demand was associated with a steep increase in burnout, but this was not the case for low neuroticism where the slope was again not found to be significantly different from zero. A significant interaction between work locus of control and job demand in the prediction of burnout was not found. Hypotheses 39 and 40 are supported, but Hypothesis 38 is not. The results are summarized in figures 5.13, 5.14, and 5.15.

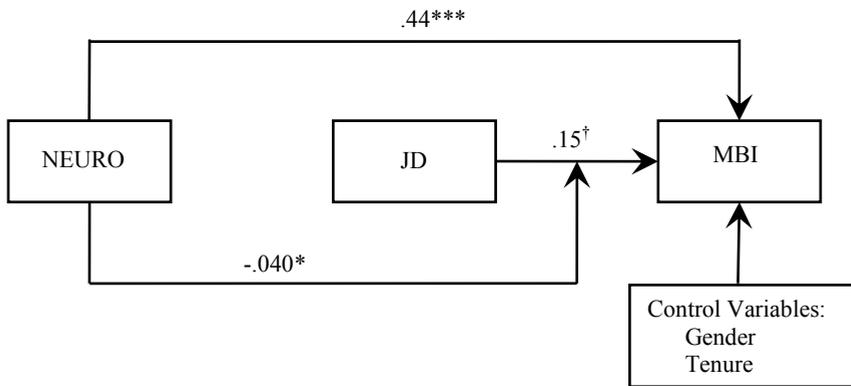
FIGURE 5.13 Relationships between Conscientiousness, Job Demand (JD) and Burnout (MBI)



Notes: Standardized coefficients are shown; except for interaction terms were unstandardized coefficients are shown to prevent misinterpretation of the results.

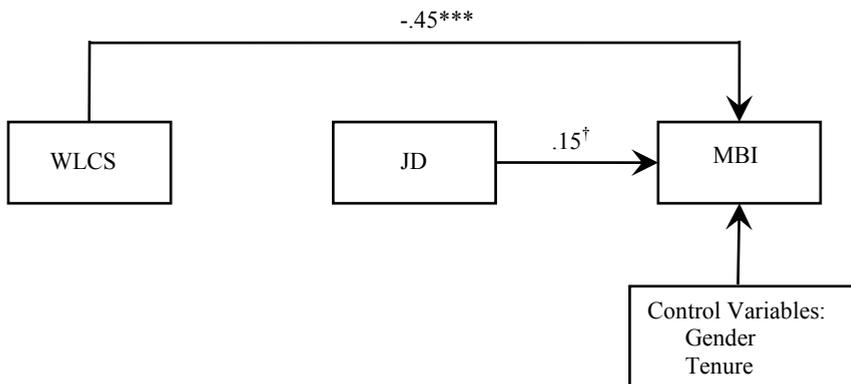
† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 5.14 Relationships between Neuroticism, Job Demand (JD) and Burnout (MBI)



Notes: Standardized coefficients are shown; except for interaction terms were unstandardized coefficients are shown to prevent misinterpretation of the results.
[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 5.15 Relationship between Work Locus of Control, Job Demand (JD) and Burnout (MBI)



Notes: Standardized coefficients are shown.
[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

5.3.10 Analysis for Dependent Variable Occupational Self-Efficacy

Occupational self-efficacy was found to be normally distributed for skewness ($z = -.014$) and to have a positive value of kurtosis, 1.96 ($z = 4.53$). This was not expected to be a problem in the analysis, as underestimates of variance associated with positive kurtosis disappear in samples of more than 100 cases (Tabachnick & Fidell, 2006: 80).

Analysis 5.19 is the initial analysis and is conducted for the independent variable OCCSEFF and independent variables gender, tenure, JD, CONSC, NEURO and WLCS. The relationship of each of the three personality variables with occupational self-efficacy was investigated, and the relative effects assessed. Hypothesis 42, 43 and 44 were tested. In analysis 5.20, the effects of nonnormality of the independent variables JD and CONSC on the results was investigated. In analysis 5.21, the significance of the hypothesized three-way interaction between conscientiousness, neuroticism and work locus of control (Hypothesis 45) was investigated. In analysis 5.22, this analysis was repeated with a number of cases removed to confirm that the results were not dependent on a few potential outliers. In analysis 5.23, the effect of the nonnormality of the variables JD and CONSC on the significance of the three-way term predicting occupational self-efficacy was assessed.

Analysis 5.19

As previously (see chapter 4), model 25 included only the control variables. To determine the individual relationships with occupational self-efficacy and to test Hypotheses 42, 43 and 44, each of the variables CONSC, NEURO and WLCS were added separately to this model to give models 58, 59 and 60, respectively. To confirm the relationships while partialing out the effect of the other two independent personality variables, and to compare the effects of each of the three personality traits on the dependent variable, the CONSC and NEURO terms were added to model 60 to give model 61. The results from the regression analysis are shown in table 5.17.

Conscientiousness and work locus of control were found to be positively related to occupational self-efficacy ($B = .539, p = .000$ and $B = .396, p = .000$, respectively), whilst neuroticism was found to be negatively related ($B = -.507, p = .000$). All three terms (CONSC, NEURO and WLCS) were found to have a moderate effect size. The addition of each term to model 25 resulted in an increase of the squared partial correlations R^2 of .137, .171 and .136, for conscientiousness, neuroticism and work locus of control, respectively. In model 58 all three personality terms had significant coefficients. The R^2 value for the model was .32 and the F value was 8.986, $p = .000$. The relative effects of each of the three personality variables on individuals' occupational self-efficacy are indicated from the value of their respective standardized coefficients in this model. The NEURO and the WLCS terms were found to have a similar, but opposite, effect with standardized coefficients $\beta = -.305$ and $\beta = .302$, respectively. The standardized coefficient for CONSC had a slightly lower value of $\beta = .208$.

Inspection of the P-P plot and the scatterplot of regression standardized residuals (see figures A-5.11 and A-5.12, respectively, in appendix 5) showed no violations of assumptions. The maximum Cook's distance and value of $DFBETA$ in this analysis

were .389 and .069, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients.

Analysis 5.20

To check for the effects of the nonnormality of the distribution of the variables of job demand and conscientiousness, analysis 5.19 was repeated for the transformed variables JD^+ and $CONSC^+$, and the results were compared between the two analyses. The results were not materially different.

TABLE 5.17 Regression Analyses for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CF, CONSC, NEURO and WLCS

Variable	Model 25	Model 58	Model 59	Model 60	Model 61	
	<i>B</i> (<i>s.e.</i>)	Beta (β)				
Constant	74.045*** (.768)	73.888*** (.717)	74.017*** (.702)	74.167*** (.717)	74.033*** (.646)	
Gender	1.123 (2.171)	1.945 (2.034)	1.005 (1.985)	.413 (2.033)	.927 (1.843)	.039
Tenure	1.557 (2.417)	2.270 (2.259)	2.030 (2.211)	1.105 (2.258)	1.942 (2.040)	.074
Job Demand	-.026 (.048)	-.014 (.044)	-.026 (.044)	.017 (.046)	.016 (.041)	.030
CONSC		.539*** (.124)	- -	- -	.300* (.121)	.208*
NEURO			-.507*** (.103)	- -	-.374*** (.101)	-.305***
WLCS				.396*** (.092)	.316*** (.084)	.302***
<i>F</i> value	.306	4.978**	6.372***	4.926 **	8.986***	
Sig. <i>F</i> Change	.821	.000	.000	.000	.000	
<i>R</i> ²	.008	.144	.178	.143	.317	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 59 and 60, the significance of the *F* change is from model 25.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

The significance of the coefficient for the CONSC⁺ term in model 58⁺⁺ was $p = .000$, which is the same as the previous result of $p = .000$ in model 58. The effect of the addition of the CONSC⁺ term to model 25 resulted in an R^2 for model 58⁺⁺ of .153, which compares to .144 for model 58. The R^2 for model 61⁺⁺ was .321 compared to .317 for model 61. As expected, in this model the NEURO and WLCS term coefficients remained almost unchanged ($B = -.366, p = .000$ and $B = .316, p = .000$, compared to the previous values of $B = -.374, p = .000$ and $B = .316, p = .000$, respectively). The significance of the coefficient for the CONSC⁺ term in model 61⁺⁺ was $p = .011$, which compares to that for the CONSC term of $p = .015$ in model 61.

Analysis 5.21

To check for a series of interaction effects and for the proposed three-way interaction, the product terms NEURO \times WLCS, CONSC \times NEURO, and CONSC \times WLCS were added separately to model 59 to give models 62, 63 and 64. All three were included to give model 65, and then the three-way term CONSC \times NEURO \times WLCS was added to give model 66. The results are shown in table 5.18.

In model 62 and 63 the product terms NEURO \times WLCS and CONSC \times NEURO were found to have significant coefficients of $B = .019, p = .067$ and $B = .032, p = .087$, respectively. In model 64 the product term CONSC \times WLCS was not found to be significant with $p = .493$. When the three-way term CONSC \times NEURO \times WLCS was added to model 65 to give model 66, the significance of the F change was $p = .020$. Cohen et al. (2003: 211) state that when considering whether to include higher-order terms, there are no hard rules. To decide between two equations of adjacent order, they recommend that the following criteria may be employed:

1. the loss (or gain) in prediction attributed to the highest-order term employing some conventional level of significance. As previously mentioned, the significance of the F change between models 65 and 66 was $p = .020$.
2. consideration of the effect size from the increase in the squared partial correlation. The introduction of the term CONSC \times NEURO \times WLCS to model 65 to give model 66 resulted in an increase in the squared partial correlation of .031, which is above the lower limit of .020 suggested (Cohen et al., 2003: 212).
3. the change in the *adjusted* R^2 . Whilst the addition of any independent variable to an equation will result in an increase of R^2 , the *adjusted* R^2 (the estimated proportion of variance in Y accounted for in the population by a polynomial of that order) may increase or decrease. A reasonable criterion for deciding between two equations is when the *adjusted* R^2 change is between .020 and .050. The *adjusted* R^2 change between the two models was .028, which is above the lower limit suggested.

TABLE 5.18 Regression Analyses for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CF, CONSC, NEURO and WLCS

Variable	Model 62	Model 63	Model 64	Model 65	Model 66
	<i>B</i> (<i>s.e.</i>)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)
Constant	74.055*** (.640)	74.339*** (.665)	74.073*** (.650)	74.267*** (.665)	74.296*** (.652)
Gender	1.495 (1.850)	.932 (1.827)	1.103 (1.865)	1.320 (1.854)	.968 (1.823)
Tenure	2.033 (2.019)	2.530 (2.051)	1.999 (2.046)	2.465 (2.047)	2.419 (2.006)
Job Demand	.028 (.041)	.022 (.041)	.020 (.042)	.029 (.041)	.033 (.040)
CONSC	.305* (.120)	.298* (.120)	.289* (.123)	.317* (.122)	.288* (.120)
NEURO	-.367*** (.100)	-.347** (.102)	-.374*** (.101)	-.343** (.101)	-.305** (.101)
WLCS	.298** (.084)	.313*** (.083)	.320*** (.084)	.290** (.085)	.170 [†] (.097)
NEURO × WLCS	.019 [†] (.010)	- -	- -	.020 (.013)	.025 (.019)
CONSC × NEURO		.032 [†] (.018)	- -	.027 (.019)	.016 (.016)
CONSC × WLCS			-.009 (.014)	.011 (.017)	.015 (.012)
CONSC × NEURO × WLCS					-.005* (.002)
<i>F</i> value	8.530***	8.258***	7.735***	6.734***	6.870***
Sig. <i>F</i> Change	.067	.087	.493	.085	.020
<i>R</i> ²	.337	.335	.320	.349	.380

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 62, 63 and 64, the significance of the *F* change is from model 61.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As all three criteria suggested by Cohen et al. (2003: 211) are met, it is suggested that conscientiousness, neuroticism and work locus of control have a significant interaction in their prediction of occupational self-efficacy. Hypothesis 45 is supported.

Inspection of the P-P plot and the scatterplot of regression standardized residuals (see figures A-5.13 and A-5.14, respectively, in appendix 5) showed no material violations of assumptions. The maximum value for the Variance Inflation Factor (VIF) in the analysis was 1.721, indicating multicollinearity was not a problem. The maximum Cook's distance and value of *DFBETA* in this analysis were .365 and .082, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients. Cohen et al. (2003: 411) recommend very careful screening of outliers in regression equations containing interaction terms. It was decided to recheck Mahalanobis distances for each case in this analysis. Eight cases were found to have Mahalanobis distances that exceeded the critical value of 25.74 (see section 3.3.6). The analysis was repeated with these cases removed.

Analysis 5.22

With the cases removed the significance of the *F* change between models 65 and 66 was $p = .048$. The *adjusted R*² increased by .023, which is slightly lower than previously, but still above the lower limit of .020. The three-way term CONSC × NEURO × WLCS had an unstandardized coefficient of $B = -.007$, $p = .048$. The *F* value for model 66 was 3.636, $p = .000$. The *R*² reduced from .380 previously to .259. It is suggested that the significance of the three-way term is not dependent on a small number of outlying cases.

Analysis 5.23

To confirm the effects of the nonnormality of the independent variables JD and CONSC, the analysis was repeated including the transformed variables JD⁺ and CONSC⁺ in the models. The significance of the *F* change between models 65⁺⁺ and 66⁺⁺ improved from $p = .020$, previously, to $p = .012$. The increase in adjusted *R*² between models was .031, which is larger than the value of .028 in analysis 5.21. The *R*² for model 66⁺⁺ was .385, which is a slight increase on the previous value. It is concluded that the results were not adversely influenced by the nonnormality of the independent variables JD and CONSC.

Analysis 5.24

The procedure for probing three-way interactions outlined by Aiken and West (1991: 54) was followed to generate the equations for the simple slopes, and to conduct significance checks. The plots for the interactions between work locus of control and neuroticism for high and low levels of conscientiousness are shown in figures 5.16 and 5.17, respectively.

FIGURE 5.16 Interaction between Work Locus of Control and Neuroticism for Low Conscientiousness Predicting Occupational Self-Efficacy

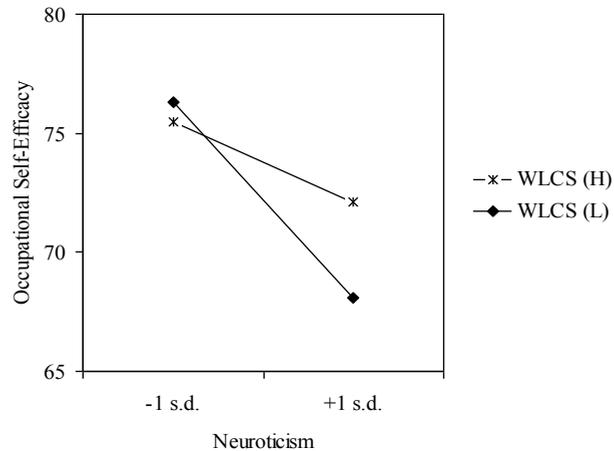
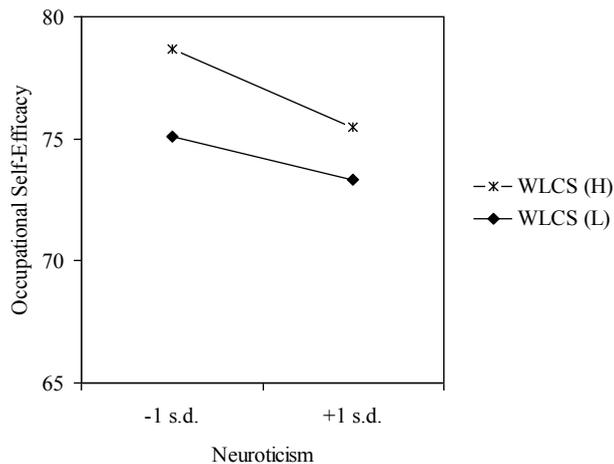


FIGURE 5.17 Interaction between Work Locus of Control and Neuroticism for High Conscientiousness Predicting Occupational Self-Efficacy

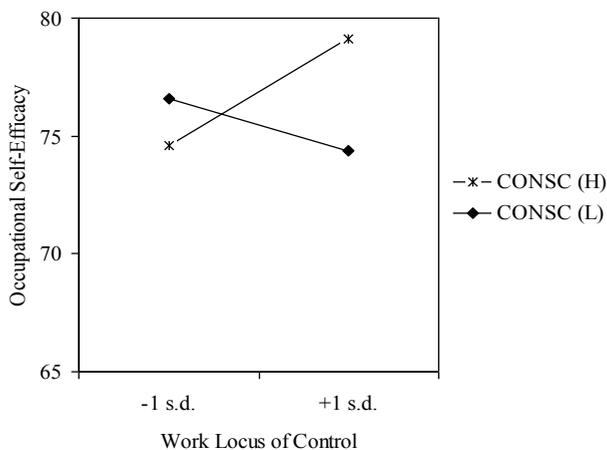


In figure 5.16, the slope for $WLCS_L$ was found to be highly significantly different from zero ($p = .000$), and the slope for $WLCS_H$ was found to be nonsignificant ($p = .129$) (repeating the analysis with the controls removed did not result in a change in significance). In figure 5.17 the slope for $WLCS_L$ was found to be nonsignificant ($p = .479$). The slope for $WLCS_H$ was found to be close to significance ($p = .145$). Repeating the procedure with the three controls of gender, tenure and job demand removed resulted in the slope being just within significance ($p = .097$). As expected, the highest

value of occupational self-efficacy was indicated for the case of high conscientiousness, high work locus of control and low neuroticism, and the lowest level for low conscientiousness, low work locus of control and high neuroticism. Although only three of the slopes can be regarded as significant, in all four cases as neuroticism increased occupational self-efficacy decreased, as expected.

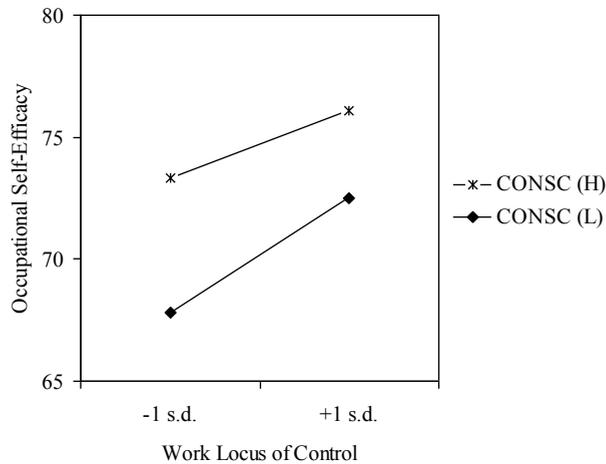
For ease of interpretation the procedure was also conducted for the interactions between work locus of control and conscientiousness for high and low levels of neuroticism. The plots are shown in figures 5.18 and 5.19, respectively.

FIGURE 5.18 Interaction between Conscientiousness and Work Locus of Control for Low Neuroticism Predicting Occupational Self-Efficacy



In figure 5.18 the slope for $CONSC_H$ was found to be significantly different from zero ($p = .011$), while the slope for $CONSC_L$ was found to be nonsignificant ($p = .468$). In figure 5.19 the slope for $CONSC_H$ was found to be nonsignificant ($p = .297$), and the slope for $CONSC_L$ was found to be highly significant ($p = .005$). As can be seen from figure 5.18, when neuroticism is low, an increase in occupational self-efficacy will only occur as work locus of control increases when conscientiousness is high. When conscientiousness is low, as work locus of control increases the slope (although not significant) indicates a decline in occupational self-efficacy. This supports the prediction that for occupational self-efficacy to occur as work locus of control increases, low neuroticism and high conscientiousness are required. Interestingly, from figure 5.19, it can be seen that although at a much lower level, an increase of work locus of control is also associated with an increase in occupational self-efficacy when neuroticism is high and conscientiousness is low, but not when conscientiousness is high. These findings are discussed in section 5.4 below.

FIGURE 5.19 Interaction between Conscientiousness and Work Locus of Control for High Neuroticism Predicting Occupational Self-Efficacy



5.3.11 Summary of Results for Dependent Variable Occupational Self-Efficacy

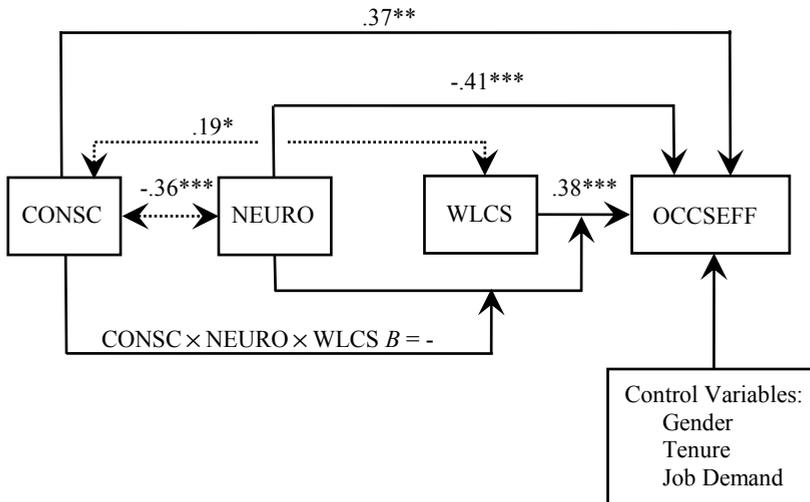
The results of this section suggest that, in this study, conscientiousness and work locus of control are positively related to occupational self-efficacy, and neuroticism is negatively related. When occupational self-efficacy was regressed separately onto each of the personality trait variables, while controlling for gender, tenure and job demand, the effects for conscientiousness, neuroticism, and work locus of control on occupational self-efficacy were found to be moderate in size. Neuroticism had the largest effect size (negative), while the effect sizes for conscientiousness and work locus of control were similar (both positive) (increases in the squared partial correlations R^2 of .171, .137 and .136, respectively). Hypothesis 42, 43, and 44 are supported.

When occupational self-efficacy was regressed onto all three of the personality trait variables, while controlling for gender, tenure and job demand, the additional variance explained was 31.7%. All three personality traits were significantly related to occupational self-efficacy when the effects of the other two traits were controlled for. Neuroticism and work locus of control were found to have a similar level, but opposite effect on occupational self-efficacy, while conscientiousness was found to have a slightly lower effect. The standard coefficients were $\beta = .208, p = .015$, $\beta = -.305, p = .000$ and $\beta = .302, p = .000$. The R^2 value for this model was .317.

The three-way term $\text{CONSC} \times \text{NEURO} \times \text{WLCS}$ was found to have a significant coefficient, suggesting that conscientiousness, neuroticism and work locus of control interact in the prediction of occupational self-efficacy. Hypothesis 45 is supported. When all three personality variables and their interactions were included in the model,

the R^2 value was .380 and the adjusted R^2 value was .325. The results are summarized in figure 5.20.

FIGURE 5.20 Relationships between Conscientiousness, Neuroticism and Work Locus of Control and Occupational Self-Efficacy



Notes: Standardized coefficients are shown; except for interaction terms were unstandardized coefficients are shown to prevent misinterpretation of the results and except for dotted lines where the Pearson Correlation (two-tailed) is shown.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

5.4 DISCUSSION

5.4.1 Personality and Burnout

The central objective of this chapter was to investigate whether the personality traits of conscientiousness, neuroticism and work locus of control were important antecedent factors for burnout. As predicted from consideration of Lazarus and Folkman's (1984) cognitive appraisal model of stress and the conservation of resources model of burnout (Hobfoll, 1989), all three personality traits were found to be significantly related to burnout and the three components, except for the case of neuroticism and depersonalization where support for a significant relationship was limited. As predicted, neuroticism was found to be positively related to burnout and its components, while conscientiousness and work locus of control were found to be negatively related.

As previously mentioned (see section 5.2.1), prior research on conscientiousness and burnout has produced rather mixed findings. The bivariate correlations for conscientiousness in this study were of the same direction and magnitude as that of Deary et al. (1996) for emotional exhaustion ($r = -.30, p < .01$ and $r = -.22, p < .01$,

respectively), and reduced personal accomplishment ($r = -.21, p < .05$ and $r = -.35, p < .01$, respectively) and of Deary et al. (2003), for depersonalization ($r = -.26, p < .01$ and $r = -.37, p < .05$, respectively). However, they are in contrast to the findings of Bakker et al. (2006) and Zellars et al. (2000), where no significant relationships were found between conscientiousness and the three burnout components. As can be expected from the above, the finding in this study that conscientiousness predicted emotional exhaustion with a significant standardized coefficient ($\beta = -.20, p < .05$) is not consistent with the findings, in the only two studies that the author is aware of conscientiousness and the components of burnout using regression analysis, of Bakker et al. (2006) and Zellars et al. (2000), where conscientiousness was not found to significantly predict depersonalization.

Prior studies of neuroticism and burnout have produced consistent findings (see section 5.2.1) (see, for example, Bakker et al., 2006; Deary et al., 1996; Francis et al., 2004; Hetland et al., 2007; LePine et al., 2004; Piedmont, 1993; Zellars et al., 2000). The bivariate correlations in this study were consistent in direction and magnitude with this prior research. For example, in the Zellars et al. (2000) study, the correlations between neuroticism and emotional exhaustion, depersonalization and reduced personal accomplishment were $r = .50, p < .05$, $r = .23, p < .05$ and $r = .23, p < .05$, respectively, while in this study they were $r = .49, p < .001$, $r = .21, p < .05$ and $r = .19, p < .05$, respectively. The finding of neuroticism predicting emotional exhaustion in this study is also consistent with the previous studies involving regression analysis of Bakker et al. (2006) and Zellars et al. (2000). The values of the standardized coefficients were $\beta = .42, p < .001$, $\beta = .36, p < .01$, and $\beta = .32, p < .01$, respectively. For depersonalization, the results of this study are consistent with those of Zellars et al. (2000), which also found the relationship between depersonalization and neuroticism to be nonsignificant. However, this finding is inconsistent with the study of Bakker et al. (2006), where the relationship was found to be significant ($\beta = .26, p < .001$). The failure of neuroticism to be highly significant in the prediction of depersonalization in this study may have arisen from the lack of variance in this sample, although it is noted that both conscientiousness and work locus of control did significantly predict depersonalization.

For work locus of control, the bivariate correlations in this study were in the same direction, but of a slightly higher magnitude than those found from the meta-analysis of Ng et al. (2006). These were $r = -.45, p < .001$ and $r = -.27, p < .05$, respectively, for burnout, $r = -.33, p < .001$ and $r = -.25, p < .05$, respectively, for emotional exhaustion, $r = -.30, p < .01$ and $r = -.16, p < .05$, respectively, for depersonalization and $r = -.32, p < .001$ and $r = -.05, p < .05$, respectively, for reduced personal accomplishment. This provides some support for following the recommendation of Phares (1976) and Daniels and Guppy (1992), that locus of control is treated as a domain-specific construct, as reflected in the use in this study of the work locus of control scale rather than a general scale. It also supports Blau's (1993) suggestion that the work locus of control scale has a

better conceptual fit to work-related outcomes than more general scales such as Rotter's (1966).

When the unidimensional measure of burnout was regressed separately on each of the personality trait variables, while controlling for gender, tenure and job demand, the effects for conscientiousness, neuroticism and work locus of control on burnout were found to be moderate in size. Neuroticism and work locus of control had greater effect sizes than conscientiousness (increase in the squared partial correlations R^2 of .198, .188 and .137, respectively). The effect sizes tended to be larger for emotional exhaustion than for depersonalization or reduced personal accomplishment. As expected, neuroticism was most strongly related to emotional exhaustion with the largest effect size, explaining an additional 24.0% of variance, while controlling for gender, tenure and job demand. Unexpectedly, neuroticism was only related to reduced personal accomplishment with a small effect size (additional 3.5% of variance explained), and the findings only gave partial support for a significant relationship with depersonalization. Conscientiousness had a moderate effect size on emotional exhaustion and small effect sizes on depersonalization and reduced personal accomplishment (additional 8.9%, 5.7% and 4.0% of variance explained, respectively). Work locus of control had moderate effect sizes on emotional exhaustion and reduced personal accomplishment, and a small effect size on depersonalization (additional 10.0%, 9.6% and 6.9% of variance explained, respectively). The finding that work locus of control is more related to emotional exhaustion and reduced personal accomplishment than depersonalization is consistent with the findings of Kalbers and Fogarty (2006).

When the unidimensional measure of burnout was regressed onto all three of the personality trait variables, while controlling for gender, tenure and job demand, the additional variance explained was 36.6%. The adjusted R^2 for this model was .35. All three traits were found to significantly predict the unidimensional measure of burnout. Interestingly, work locus of control and neuroticism were found to have similar, but opposite values, of standardized coefficients ($\beta = -.37, p < .001$ and $\beta = .34, p < .001$, respectively). Conscientiousness was found to have a lower standardized coefficient ($\beta = -.16, p < .1$).

For each of the components of burnout the three traits together explained additional variance over that explained by gender, tenure and job demand of 31.7% for emotional exhaustion, 10.5% for depersonalization and 13.3% for reduced personal accomplishment. For emotional exhaustion, neuroticism was found to be the most important trait with a positive relationship ($\beta = .42, p < .001$), while work locus of control had a smaller, but negative, relationship ($\beta = -.25, p < .01$). The relationship between conscientiousness and emotional exhaustion was not found to be significant when the effects of the other two traits were partialled out. For depersonalization, work locus of control and conscientiousness were both found to have a negative relationship and almost equal effect with similar values of standardized coefficients ($\beta = -.23, p < .05$

and $\beta = -.20, p < .05$, respectively). Neuroticism was not found to have a significant relationship with depersonalization when the effects of the other two traits were partialled out. Of the three traits, work locus of control was found to be the most important predictor of reduced personal accomplishment with a negative relationship ($\beta = -.14, p < .001$). The relationships between both conscientiousness and neuroticism with reduced personal accomplishment were found to be nonsignificant when the effects of the other personality traits were partialled out. These results provide further support for the conclusion of Ng et al. (2006: 1074) that “locus of control is a personality trait that has at least the same, if not greater, predictive power for some commonly examined work outcomes as the Big Five personality traits.”

These findings provide strong support that each of the personality traits of conscientiousness, neuroticism and work locus of control are important antecedent factors in the development of burnout.

5.4.2 The Interactions between Personality and Job Demand Predicting Burnout

As previously mentioned, in this study, an external measure of job demand based on the level of actual performance measured by statistics from the Office of National Statistics against target was used (see section 3.2.7). In the previous chapter (see section 4.4.3), the effect sizes for job demands on emotional exhaustion and burnout were found to be small, and it was discussed that perhaps the measure as a proxy for job demand suffered from a number of weaknesses in that it is not immediate and only a very limited number of individuals achieved a better than target performance. However, it is interesting to note that the findings of this chapter supported significant interactions between work locus of control and job demand in the prediction of emotional exhaustion and between both conscientiousness and neuroticism in the prediction of the unidimensional burnout measure. For convenience the plots (figures 5.1, 5.11 and 5.12) are reproduced below.

From figure 5.1, it can be seen that when work locus of control is external (low), then as the job demand increases the level of emotional exhaustion is predicted to increase, whereas for the case of internal (high) work locus of control an increase in job demand does not result in an increase in emotional exhaustion. This is as predicted, and is consistent with previous research that suggests that internality of locus of control is associated with lower perceptions of stressors and strains (Spector et al., 2004) and positively related to the use of problem-focused coping and negatively related to emotion-focused coping (Ng et al., 2006). The findings can be explained by externals being generally more anxious than internals (Phares, 1976) and tending to see sources of stress as outside of their control and so adopting less effective coping styles than internals (Fusilier et al., 1987). It is also consistent with the previous research that suggests that externals are more vulnerable and suffer higher levels of stress (James &

Wright, 1993) and the positive relationship between internal work locus of control and individuals well-being (Martin et al., 2005; Siu et al., 2002; Spector et al., 2002) .

FIGURE 5.1 (replicated) Interaction between Job Demand (JD) and Work Locus of Control (WLCS) Predicting Emotional Exhaustion (EE)

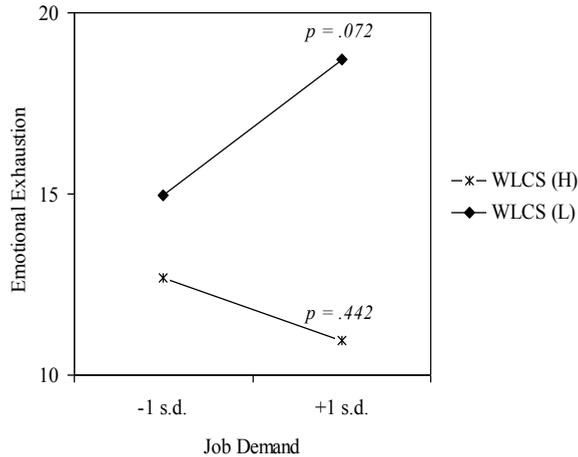
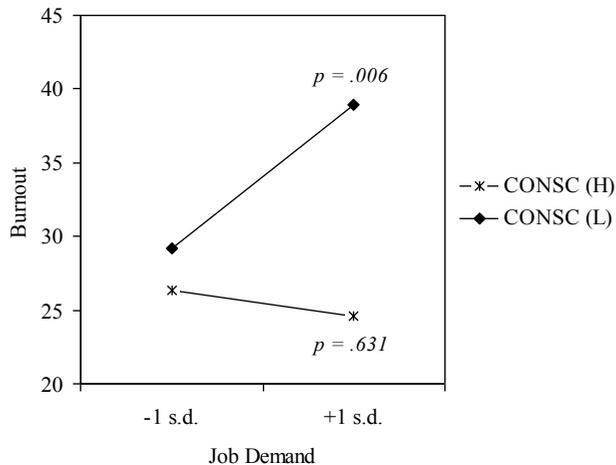


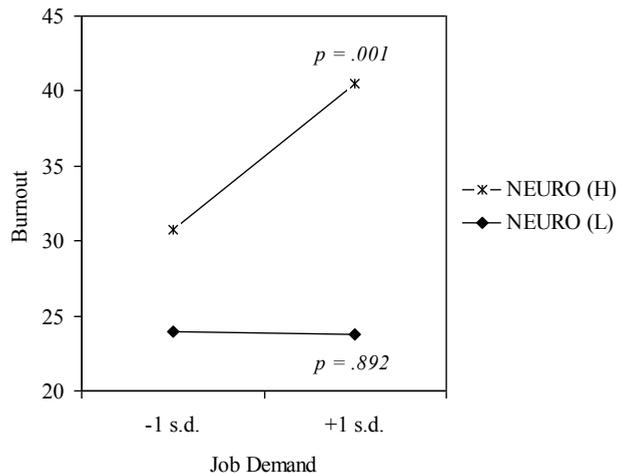
FIGURE 5.11 (replicated) Interaction between Job Demand (JD) and Conscientiousness (CONSC) Predicting Burnout (MBI)



In figure 5.11, it can be seen that an increase in job demand is associated with an increase in burnout for the case of low conscientiousness, but not for the case of high conscientiousness. This finding is consistent with that predicted from consideration of Lazarus and Folkman's (1984) cognitive appraisal model of stress. The model predicts

that primary cognitive appraisal of a stressful situation is influenced by factors such as the individual's assessment of their problem-solving and other skills and the secondary appraisal process involving an evaluation by the individual of their capabilities and resources in relation to the demands (Lazarus & Folkman, 1984). As conscientiousness has been found to be associated with positive coping styles such as problem-solving coping and cognitive restructuring (Connor-Smith & Flachsbart, 2007), conscientious individuals tend to be more organized, hard working, and efficient at carrying out tasks (Barrick & Mount, 1993), whilst those low in conscientiousness tend to be easy going, lazy and disorganized (Spangler et al., 2004). From this it follows that individuals low in conscientiousness will make more negative primary and secondary appraisals than those high in conscientiousness, and will cope with the demands they face less effectively than conscientious individuals. The finding is also consistent with the outcomes predicted from the conservation of resources theory as individuals low in conscientiousness will have lower levels of personal resources and be less able to replenish them than individuals who are high in conscientiousness.

FIGURE 5.12 (replicated) Interaction between Job Demand and Neuroticism Predicting Burnout (MBI)



In figure 5.12, it can be seen that an increase in job demand is associated with an increase in burnout for the case of high neuroticism, but not for the case of low neuroticism. This finding is again as predicted, and consistent with that suggested from consideration of the cognitive appraisal model of stress and the conservation of resources model. Emotionally unstable individuals (those high in neuroticism) will perceive demands more negatively than emotionally stable individuals (Bono & Judge, 2004), are more likely to adopt negative coping behaviours to the demands they face (Connor-

Smith & Flachsbart, 2007; McCrae & Costa, 1996), and are less likely to adopt positive coping styles (O'Brien & DeLongis, 1996). As such they are more likely to be prone to stress (Costa et al., 1986).

These findings confirm that the three personality traits of conscientiousness, neuroticism and work locus of control are important antecedent factors in the development of burnout and its three components.

5.4.3 The Relationships between Personality and Occupational Self-Efficacy

An additional aim of this section was to investigate whether the personality traits of conscientiousness, neuroticism and work locus of control were antecedent factors in the development of occupational self-efficacy. When occupational self-efficacy was regressed onto all three of the personality trait variables, while controlling for gender, tenure and job demand, all three traits were found to significantly predict occupational self-efficacy and the additional variance explained was 30.9%. As predicted, conscientiousness and work locus of control were found to be positively related and neuroticism was found to be negatively related.

The findings in this section for the relationships between the three personality traits and occupational self-efficacy are consistent in direction, but slightly reduced in magnitude from the available previous research. For example, for conscientiousness, the results of this study were consistent with the research of Martocchio and Judge (1997) into conscientiousness and generalized self-efficacy ($r = .36, p < .001$ and $r = .49, p < .01$, respectively). For neuroticism they were consistent with the findings of Schyns and von Collani (2002) ($r = -.41, p < .001$ and $r = -.51, p < .01$, respectively) and for work locus of control they were consistent with the findings of Schyns and von Collani (2002) of locus of control ($r = .37, p < .001$ and $r = .49, p < .01$, respectively). When occupational self-efficacy was regressed onto the three personality trait variables, while controlling for gender, tenure and job demand, the standardized coefficients for conscientiousness, neuroticism and work locus of control were $\beta = .208, p < .001$, $\beta = -.305, p < .001$ and $\beta = .302, p < .001$. The values for conscientiousness and neuroticism are similar in magnitude to those found by Cohrs et al. (2006) in a study of three samples of German professionals (260 mathematics teachers, 323 professionals in business and 482 employees of private business). Cohrs et al. (2006) regressed occupational self-efficacy on the Big Five personality factors and found an average across the three studies of $\beta = .24, p < .001$ for conscientiousness and $\beta = -.36, p < .001$ for neuroticism.

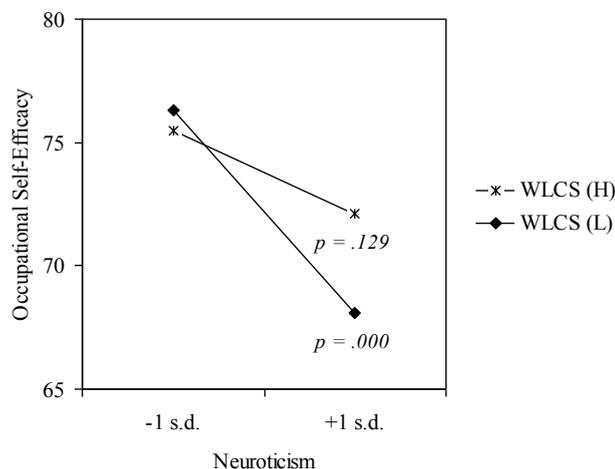
When occupational self-efficacy was regressed separately on each of the personality trait variables, while controlling for gender, tenure and job demand, the effects for all three traits were found to be moderate in size. Neuroticism had a larger effect size than conscientiousness and work locus of control (increase in the squared partial correlations R^2 of .171, .137 and .136, respectively).

The results are as expected and confirm that conscientious individuals are more likely to have higher occupational self-efficacy than those low in conscientiousness. This is consistent with the arguments presented earlier. Conscientious individuals are more motivated to learn (Colquitt & Simmering, 1998); and while they are more likely to challenge themselves through the setting of ambitious targets and goals (Barrick & Mount, 2005; Costa et al., 1991), they are also more likely to make positive appraisals of their personal resources and capabilities.

Individuals low in neuroticism (emotionally stable) are predicted to have higher levels of occupational self-efficacy than those high in neuroticism. Emotional stability has been found to be a strong predictor of performance motivation (Judge & Ilies, 2002) and a consistent predictor of performance across a wide range of settings (Barrack & Mount, 1991; Barrick et al., 2001; Salgado, 1997). Individuals who are high in neuroticism tend to suffer from high levels of worry and feel inadequate (Costa et al., 1986). As Conger and Kanungo (1988) observe, individuals are more likely to feel competent when they are not adversely aroused. Internal individuals (high work locus of control) are predicted to have higher levels of occupational self-efficacy than externals (low work locus of control). Internals see themselves as active agents and trust their capability to influence their environment (Phares, 1976), while externality is related to feelings of hopelessness (Lefcourt, 1976).

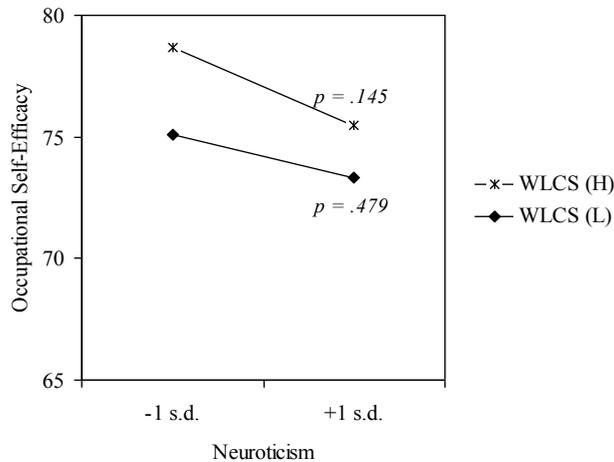
Further to these findings the results also indicated that the three personality traits studied interact in their prediction of occupational self-efficacy. For convenience the plots (figures 5.16, 5.17, 5.18 and 5.19) are reproduced below.

FIGURE 5.16 (replicated) Interaction between Work Locus of Control and Neuroticism for *Low* Conscientiousness Predicting Occupational Self-Efficacy



It can be seen from figures 5.16 and 5.17 that, as expected, as neuroticism increases occupational self-efficacy decreases, for all levels of conscientiousness and work locus of control. The slope for the case of low conscientiousness and externality is steeper than for the other three cases. It can also be seen that, generally, internality of work locus of control results in higher levels of occupational self-efficacy. The plots in figure 5.17 suggest that high conscientiousness can, to some extent, offset the decline in occupational self-efficacy associated with an increase in neuroticism for both external and internal individuals.

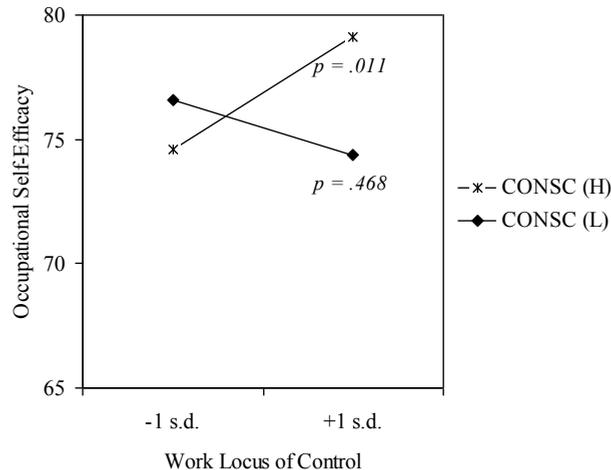
FIGURE 5.17 (replicated) Interaction between Work Locus of Control and Neuroticism for *High* Conscientiousness Predicting Occupational Self-Efficacy



These findings provide support for the arguments of both Bandura (1986), that an individual's psychological state is an important factor in the development of self-efficacy judgments, and Gist and Mitchell (1992), that while the analysis of task requirements and attributional analysis of past experience are required, they are not sufficient to allow the formation of self-efficacy. Gist and Mitchell (1992) posit that the assessment of the self, the setting and the availability of specific resources are important, and that this assessment requires consideration of personal factors such as skill level, anxiety level, desire and available effort, and of the situational factors such as competing demands and distractions that will impact on performance. As neurotic individuals suffer from high levels of worry, are emotional and insecure, have feelings of inadequacy (Costa et al., 1986), tend to worry about unpleasant situations, react negatively to unexpected events, take a long time to return to a normal emotional state (Spangler et al., 2004) and have less energy (Stewart & Barrack, 2004), it follows from Gist and Mitchell's (1992) argument that high levels of neuroticism will result in a decline in occupational self-efficacy even when conscientiousness and work locus of control are

high and positive assessments are made of task requirements, personal resources and the attributional analysis of past experiences.

FIGURE 5.18 (replicated) Interaction between Conscientiousness and Work Locus of Control for *Low* Neuroticism Predicting Occupational Self-Efficacy

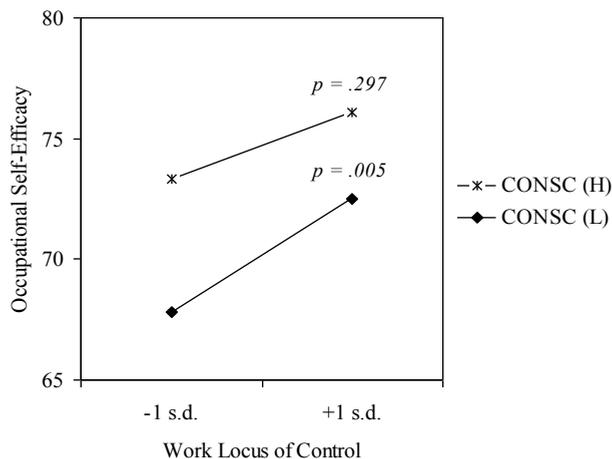


From figure 5.18 it can be seen that in the case of low neuroticism, as internality of work locus of control increases, for the case of high conscientiousness but not for the case of low conscientiousness occupational self-efficacy increases. As expected, the highest value observed in the four figures occurs for low neuroticism, high conscientiousness and high work locus of control. The plots in this figure indicate that when neuroticism is low, an increase in internality of locus of control is not sufficient to result in an increase in occupational self-efficacy. It appears that while internals will make more positive judgments of their personal resources and capabilities, will make more positive attributional analyses of past experiences, and will be motivated to exert control over their environment, they need the characteristics and behaviours associated with high conscientiousness of competence, organizational ability, self-discipline, planning skills and thoughtfulness (Costa et al., 1991) rather than the negligent, aimless and disorganized behaviours associated with low conscientiousness (Barrick & Mount, 1993).

In figure 5.19, it can be seen that, as expected, and consistent with the previous discussions, when neuroticism is high, an increase in internality of work locus of control does not result in a significant increase in occupational self-efficacy for the case of high conscientiousness. Interestingly, when neuroticism is high, an increase in internality of work locus of control does result in a significant increase in occupational self-efficacy for low conscientiousness. However, it must be noted that the increase is from the lowest

level observed in the four plots and does not reach the next lowest level for the case of high neuroticism, high conscientiousness, and low work locus of control. This result was not predicted. The following explanation is provided as an attempt to explain this finding. Emotional instability is associated with reduced achievement striving (Stewart & Barrick, 2004) and low conscientiousness is associated with a low need for achievement (Costa et al., 1991). Individuals low in conscientiousness tend to be more easy-going, less exacting on themselves and others (Barrick & Mount, 1993). As work locus of control increases, the individual feels more able to influence their environment and their belief that their actions will influence outcomes increases (Rotter, 1966). As self-efficacy involves a judgment of their capabilities in relation to tasks, it may be that individuals low in conscientiousness will set less ambitious goals for themselves, and their self-efficacy will increase as their internality increases, believing they are more capable of controlling their desired outcomes through their actions.

FIGURE 5.19 (replicated) Interaction between Conscientiousness and Work Locus of Control for *High* Neuroticism Predicting Occupational Self-Efficacy



5.4.4 Conclusions

The findings of this chapter support the important role of the personality factors of conscientiousness, neuroticism and work locus of control in the etiology of burnout and as antecedent factors for occupational self-efficacy. It is interesting to note that the relationships of each of the three personality traits, with both burnout and occupational self-efficacy, were found to be significant, but asymmetric.

The study provides support for the role of individual cognitive processes in the development of burnout and for the conservation of resources model. A strength of the study is the use of an external measure as a proxy for job demand. The significant interactions between the personality traits and job demand in the prediction of emotional

exhaustion (for the case of work locus of control), and the unidimensional measure of burnout (for the cases of conscientiousness and neuroticism), provides empirical support for the use of Lazarus and Folkman's (1984) cognitive appraisal model of stress in the study of burnout, and supports the importance of individual differences in motivation and cognition on perceptions of environmental demands and outcomes, as well as on the coping styles adopted.

It is expected that the individuals in this study would have high levels of autonomy, and that normative guidelines for behaviour would be absent (i.e. the work place is likely to be very political). It may be that the strength of the relationships between the personality factors and burnout in this field setting may be due, as suggested by Barrick et al. (2005), to individuals behaving more consistently with their personality traits when environmental conditions are weak.

The study meets the calls of Zellars et al. (2000) for further research into whether personality plays a meaningful role in the development of burnout and of Buunk and Schaufeli (1993) into the moderating roles of personality characteristics. It provides an additional study, to the limited number of previous studies, into the role of personality traits in the development of burnout. It provides research of a new setting to that previously, and is noteworthy in that it is of middle managers engaged in the formulation and implementation of strategy rather than of health care providers (doctors, nurses, occupational therapists and councillors) or undergraduate students, which have predominated previous studies. The study incorporates personality factors from the Big Five and work locus of control for the first time that the author is aware, and assesses individual and relative effects for each of the traits on burnout and the three components. The findings suggest that work locus of control is as important as neuroticism in the prediction of both burnout and occupational self-efficacy. The finding of significance of the three-way interaction between conscientiousness, neuroticism and work locus of control in the prediction of occupational self-efficacy provides support for Erez and Judge's (2001) recommendation that personality traits should not be tested in isolation.

CHAPTER 6

THE IMPACT OF THE PERSONALITY TRAITS OF CONSCIENTIOUSNESS, NEUROTICISM AND WORK LOCUS OF CONTROL ON LMX AND COMMUNICATION FREQUENCY

6.1 INTRODUCTION

LMX theory (see section 2.3) is unique in that it is the only leadership approach that makes the dyadic relationship between the leader and the follower the pivotal concept in the leadership process (Northouse, 2004). LMX theory suggests that intra-dyadic communication is essential for the development of LMX quality (Graen & Uhl-Bien, 1995). The major contributions of LMX theory to the understanding of leadership are from its fundamental premise that leaders form different relationships with each of their subordinates (Sparrowe & Liden, 1997), that it acknowledges the role of the follower in the leadership process, and in that it emphasizes the roles of both the leader and the follower, in terms of their impact on the leadership relationship (Howell & Shamir, 2005).

In a theoretical article on the development of LMX, Wayne et al. (1994) observed that research had just begun on the potential antecedent factors for LMX development. Even though there are strong theoretical reasons to expect individual differences to affect LMX (Bauer & Green, 1996; Yukl, 1989), little attention has been directed to the role of personality as antecedent factors to LMX quality (Gerstner & Day, 1997; Liden et al., 1997; Martin et al., 2005). Gerstner and Day (1997) call for further research into factors such as leader and member personality traits. Spangler (2004) suggests that the Five Factor model of personality may be useful in making advances in understanding of personality and leadership.

In this chapter, the relationship between communication frequency and LMX quality was confirmed, and an additional study to the very limited number of prior studies, was conducted into the role and relative importance of the personality factors of conscientiousness, neuroticism and work locus of control as antecedent factors to LMX quality. The influence of the three personality factors on communication frequency was also investigated.

6.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES

Ashford and Tsui (1991) and Barner-Rasmussen (2003) have argued that active seeking of feedback by an individual from their manager is a central part of the process of self-regulation to improve competence in the work place. Graen and Uhl-Bien (1995) suggest that managers in high-quality LMX relationships are more trustworthy and approachable, and provide greater role clarity to subordinates. Prior research has supported this statement. For example, Barner-Rasmussen (2003) found that managers

sought more feedback from superiors when levels of trust with the superior were high, and Williams, Miller, Steelman and Levy (1999) found that the frequency of feedback-seeking behaviour by individuals was higher when the leader was supportive. Followers may also be a main source of feedback for the leader. Their agreement, respect and admiration may affirm leaders' beliefs, and may validate the direction and vision proposed by the leader (Howell & Shamir, 2005). This is likely to occur more frequently in high-quality exchanges, where followers have higher levels of loyalty, express more public support for the leader, and leaders and subordinates have shared goals (Dienesch & Liden, 1986).

High-quality exchanges are warmer and friendlier in tone (Dienesch & Liden, 1986), and the supervisor is less likely to use positional power and authority (Fairhurst & Chandler, 1989). Previous research has also found a positive relationship between liking of the supervisor by the subordinate and LMX quality (Engle & Lord, 1997; Liden et al., 1993; Wayne et al., 1997), and of the individual by the supervisor (Liden et al., 1993; Wayne et al., 1997). As individuals tend to interact more with people they like (Engle & Lord, 1997), it follows that individuals in high-quality LMX relationships will interact more often with their managers than those in low-quality LMX relationships.

Prior research has confirmed that LMX quality is positively related to communication frequency (see, for example, Bauer et al., 1996; Kramer, 1995) and feedback-seeking behaviour (see, for example, Chen, Lam & Zhong, 2007; Lam et al., 2007). Therefore the following hypothesis is included for confirmation:

Hypothesis 46 *Communication Frequency is positively related to LMX quality.*

Dienesch and Liden (1986) posit that there are three dimensions to a LMX relationship: perceived contribution, loyalty and affect. Liden and Maslyn (1998) later added the fourth dimension of professional respect. Perceived contribution relates to the perception of each party of the quantity and amount of effort the other person invests into the relationship. This dimension is argued to have the largest effect (Dienesch & Liden, 1986). Loyalty refers to the level of expression of public support for the other person and the congruence of shared goals. Affect refers to the level of mutual affection each person has for the other based on interpersonal attraction rather than work or professional values, and professional respect refers to the level of esteem that each holds for the other in terms of professional ability and achievement in the work environment. Strong empirical support has been found for the existence of these four dimensions (see, for example, Liden & Maslyn, 1998; Maslyn & Uhl-Bien, 2001).

Graen and Uhl-Bien (1995) emphasize the role of perceptions of the working relationship, professional capabilities and behaviours, and not interpersonal attraction, as important for the development of the LMX relationship. The three dimensions they identify are mutual trust, respect for the capabilities of the other and obligation (Graen

& Uhl-Bien, 1995). Prior research has found the LMX-MDM measure (multidimensional scale of Liden & Maslyn, 1998) and the LMX-7 measure (unidimensional scale of Graen & Uhl-Bien, 1995, which is the scale used in this study) to be highly correlated ($r = .77$) (Maslyn & Uhl-Bien, 2001). LMX-7 was found to be correlated with each of the four dimensions of affect, loyalty, contribution and professional respect ($r = .70$, $r = .69$, $r = .46$ and $r = .66$, respectively) (Maslyn & Uhl-Bien, 2001).

As previously mentioned, individuals high in conscientiousness set ambitious goals for themselves and work hard to achieve them (Stewart & Barrick, 2004), while those low in conscientiousness tend to be easy-going, less acting on themselves and others, negligent, disorganized, lazy and aimless (Barrick & Mount, 1993; Spangler et al., 2004). Conscientious individuals tend to have a high achievement striving, are dutiful, and are persistent and thoughtful (Costa et al., 1991). Conscientiousness has been found to have incremental validity over general mental ability in the prediction of job performance (Salgado, 1988), and has been found to be a reliable predictor of job performance in a wide range of settings (Barrick & Mount, 1991; Barrick et al., 2001; Salgado, 1997). Cable and Judge (2003) found that managers' upward influencing tactics were related to their personality traits. Conscientious managers were found predominantly to use rational appeal tactics, involving the use of logical arguments and presentation of facts, to persuade their superiors. Conscientiousness has also been found to be a significant predictor of an individual's psychological contract type (Raja, Johns & Ntalianis, 2004). Psychological contract type relates to an individual's perceptions and expectations of the mutual obligations in an employment exchange relationship (Rousseau, 1989; 1995). Relational contracts are broad and long-term, and are not restricted to purely economic exchanges, but include factors such as loyalty in exchange for security and development, while transactional contracts are short-term, and are economic or materialistic in focus, entailing a limited involvement from both parties (Raja et al., 2004). Conscientious individuals were found to be more likely to engage in relational contracts (Raja et al., 2004), which can be thought of as more similar to that of high-quality LMX relationships, which are characterized by the individual receiving high levels of opportunity, valued resources and more of the leaders time and support in exchange for an investment of extra effort and advancement of the leader's agenda (Graen & Uhl-Bien, 1995).

As conscientious individuals are more likely to engage in meaningful exchanges and relational contracts with their manager than individuals low in conscientiousness, individuals who are high in conscientiousness are more likely to invest and contribute to an exchange relationship than individuals low in conscientiousness, and the individual's manager is likely to make more positive assessments of their capabilities and professionalism, it is expected that conscientiousness will be positively related to LMX.

Prior research is rather limited. The author is only aware of one publication that involves an examination of the relationship between conscientiousness and LMX, that of Lapierre and Hackett (2007). Lapierre and Hackett (2007) used meta-analytical structural equation modelling to test competing theoretical models linking organizational citizenship behaviour to conscientiousness, job satisfaction and LMX. As no previous published studies were available, they contacted scholars in the field of LMX research and located a total of six studies of conscientiousness and either LMX-7 or LMX-MDM. Of these, two involved unpublished data (Bauer et al., 2006, and Hannan & Jimmieson, 2003; both cited in Lapierre & Hackett, 2007: 546) and four were unpublished doctoral dissertations (Kraus, 2002, Sears, 2005, Smith, 2003, and Vatanen, 2003; all cited in Lapierre & Hackett, 2007: 546). The correlations found were $r = .04$, $r = .05$, $r = .21$, $r = .14$, $r = .09$ and $r = .16$ (sample 1) and $r = .43$ (sample 2), respectively. The average corrected correlation between conscientiousness and LMX quality was $r = .05$, $p < .001$ (Lapierre & Hackett, 2007). Despite the low level of the previous correlations found from consideration of the above theory, the following hypothesis is included for investigation:

Hypothesis 47 *Conscientiousness is positively related to LMX quality.*

As it is expected that conscientiousness will be positively related to LMX quality, and high-quality LMX relationships are characterized by frequent interactions (Bauer et al., 2006), it is expected that conscientiousness will be positively related to communication frequency. This is further supported from consideration of Ashford and Tsui's (1991) and Barner-Rasmussen's (2003) argument that active seeking of feedback by an individual from their manager is a central part of the process of self-regulation to improve competence in the work place. As conscientious individuals have high levels of achievement striving and competence, it follows that more conscientiousness individuals may communicate more frequently with their manager. The following hypothesis is included for investigation:

Hypothesis 48 *Conscientiousness is positively related to communication frequency.*

As mentioned in previously, the facets of neuroticism include anxiety, angry hostility, depression, self-consciousness and impulsiveness (Costa & McCrae, 1992; cited in Spangler et al., 2004: 255). Neurotic individuals tend to be less interested, have less energy, are more lacking in confidence and have a lack of achievement striving (Stewart & Barrick, 2004). Emotional stability (the opposite of neuroticism) is a reliable predictor of job performance and work behaviour across a wide range of settings (Barrick & Mount, 1991; Barrick et al., 2001; Salgado, 1997). Individuals who are low

in neuroticism are calm, secure and relaxed (Costa et al., 1986), while neurotic individuals tend to be more stress prone, nervous, emotional, and can be irritable worriers (Stewart & Barrick, 2004). Individuals who are uncertain, and regularly communicate this to their manager, are likely to be considered unfavourably (Ray, 1987). Neurotics have limited social skills and avoid situations where they need to take control (Judge, Locke & Durham, 1997; cited in Raja et al., 2004: 351). Research by Cable and Judge (2003) suggests that as emotionally stable individuals are more confident and possess more control in their ability to interact and negotiate with others, they are more likely than neurotic individuals to view trades with their leader as effective. They suggest that “neurotic individuals may have less to trade, at least in the realms of personal credibility and friendship” (Cable & Judge, 2003: 210). Research by Raja et al. (2004) found that neurotic individuals were less likely to engage in relational contracts (as previously mentioned, long-term and not restricted to purely economic exchanges) and more likely to engage in transactional contracts. As transactional contracts are short-term, are economic or materialistic in focus, and entail a limited involvement from both parties, they can be thought of as very similar to that of a low-quality LMX relationship, which tends to be based on the employment contract (Graen & Uhl-Bien, 1995).

It therefore follows that as neurotic individuals are more likely to be of a transactional than relational contract type, they are likely to be viewed less favourably by their managers in terms of the contributions and investments that they make to the relationship, and are likely to be viewed less positively in terms of their capabilities, behaviours and professional abilities than emotionally stable individuals. Hence, they are more likely to be in low-quality LMX relationships with their managers. The author was not aware of any previous research of neuroticism and LMX quality at the time of writing this dissertation. The following hypothesis is proposed for investigation:

Hypothesis 49 *Neuroticism is negatively related to LMX quality.*

As communication frequency is expected to be positively related to LMX, and neuroticism is expected to be negatively associated with LMX, it is expected that neuroticism will be negatively related to communication frequency. This is also supported from consideration of the facets of neuroticism, which include anxiety, angry hostility, depression, self-consciousness and impulsiveness (Costa & McCrae, 1992; cited in Spangler et al., 2004: 255), because people will communicate more frequently with people they like (Engle & Lord, 1997), and from consideration of the lack of social skills neurotics have (Judge et al., 1997; cited in Raja et al., 2004: 351). The following hypothesis is included for investigation:

Hypothesis 50 *Neuroticism is negatively related to communication frequency.*

Internality of locus of control (high locus of control) has consistently been found to be positively related to higher performance in organizations (see, for example, Boone et al., 1996; Blau, 1993; Howell & Shea 2001; Judge & Bono, 2001; Lefcourt, 1976; Ng et al., 2006). An internal locus of control has been found to be negatively related to cynical beliefs about human nature, and the acceptability of using manipulation to achieve personal goals (O'Conner & Morrison, 2001). Internal individuals have been found to be more satisfied with a participatory management style than external individuals (Mitchell et al., 1975), and a positive relationship has been found between locus of control internality and the use of positive upward influencing tactics such as the use of reasoned argument (Ringer & Boss, 2000). External individuals tend to be more critical and show more emotion than internal individuals who remain calmer, give support to others and form coalitions (Anderson and Schneier, 1978). Theorists have posited that internals will take active steps to initiate and maintain social relationships in times of need (Fusilier et al., 1987). External work locus of control has been found to be negatively related to relational contracts (Raja et al., 2004). External individuals have been found to be more likely to engage in aggressive, manipulative, exploiting and devious methods in order to achieve personal objectives (Gable & Dangelo, 1994), and to react to normal organizational frustrations through sabotage, aggression and withdrawal (Storms & Spector, 1987). An internal work locus of control has been found to be related to positive perceptions of organizational climate, and to an individual's levels of commitment and morale (Furnham & Drakeley 1993). Internal individuals are more inquisitive and curious (Lefcourt, 1976), and are more likely to search for relevant information than externals (Boone, 1996; Phares, 1976).

It follows that internal individuals are more likely to engage and commit to high-quality LMX relationships, will be more positively perceived by their manager in terms of their level of commitment and contribution to the relationship, and will be more highly regarded in terms of their professional abilities and competencies than external individuals. Therefore, it is predicted that internality of work locus of control will be positively related to LMX quality.

In study of 84 nurses, Phillips and Bedeian (1994) did not find a significant correlation between locus of control and perceptions of the quality of their LMX relationship with their superiors. However, in a study of 138 bank loan officers, Kinicki and Vecchio (1994) found a positive relationship between locus of control and perceptions of the quality of their LMX relationship with their manager, and LMX mediated the relationship between locus of control and organizational commitment. In a study of work locus of control (using only the eight-items of Spector's WLCS scale relating to internal control, see section 3.2.6) in two samples Martin et al. (2005) replicated this finding, and LMX was also found to mediate the relationship between work locus of control, and the employee outcomes of job satisfaction, work-related well-

being, and organizational commitment. The following hypotheses are included for investigation:

- Hypothesis 51** *Internality of work locus of control is positively related to LMX quality.*
- Hypothesis 52** *Internality of work locus of control is positively related to communication frequency.*
- Hypothesis 53** *LMX mediates the relationship between internality of work locus of control and communication frequency.*

6.3 ANALYSIS AND RESULTS

6.3.1. Initial Analysis

All scales used in the analysis were found to have adequate reliability with Cronbach's alphas above $\alpha = .70$, (LMX $\alpha = .93$, communication frequency $\alpha = .87$, conscientiousness $\alpha = .76$, neuroticism $\alpha = .81$ and work locus of control $\alpha = .84$, see section 3.2). Descriptive statistics for the variables are shown in table 3.17. Neuroticism and work locus of control were found to be normally distributed (see section 3.3.7). The following nonlinear transformations (see section 3.3.7) were used as appropriate in the analyses: $LMX^+ = \text{SQRT}(k - LMX)$, $CF^+ = \text{LOG}(CF)$, $JD^+ = \text{LOG}(JD)$ and $CONSC^+ = \text{SQRT}(k - CONSC)$. To check if common-method variance (Podsakoff & Organ, 1986) was a problem (see section 3.4) a Harmon One-Factor test (Podsakoff et al., 2003) was conducted. For each analysis, the relevant items for the scales were loaded into an exploratory factor analysis and the unrotated factor solution examined. Thirteen factors had Eigenvalues over 1.0 and the first factor extracted accounted for 17.2% of the variance. As no single factor emerged from the factor analyses and one general factor was not found for the majority of the covariance in the independent and dependent variables, it is suggested that common-method variance may not be a pervasive problem in these analyses.

Further, a confirmatory factor analysis was conducted to confirm that the items loaded cleanly onto the correct constructs. A nonorthogonal rotation method of Oblique rotation was used. In Oblique rotation the pattern matrix is used for interpretation purposes (Hair et al., 2006: 153; Tabachnick & Fidell, 2007: 625). For clarity, and because factor loadings above $\pm .30$ to $\pm .40$ are considered as the minimum acceptable (Hair et al., 2006: 129), only factor loadings above .35 are shown. Hair et al. (2006: 128) state that only factor loadings of .50 and above are significant for a sample of 120 at a significance of $p < .05$, which decreases to .45 as the sample size increases to 150. For these reasons, only values above .49 are considered as significant in this analysis. As can be seen from table A-6.1 (see appendix 6.1), all the items loaded cleanly onto their respective factors with a small number of cross-loadings between conscientiousness and neuroticism, none of which was significant. As the factor

analysis of these two personality traits (see section 3.2.5) had previously found that they loaded cleanly onto their respective factors, this is not considered to be a major problem.

Bivariate correlations were calculated for the variables, which are shown in table 6.1. As expected, communication frequency was positively correlated to LMX ($r = .436$, $p = .000$). As predicted, conscientiousness and work locus of control were positively correlated and neuroticism was negatively correlated to LMX ($r = .274$, $p = .002$, $r = .196$, $p = .030$, and $r = -.222$, $p = .013$, respectively). Work locus of control was positively correlated to communication frequency ($r = .212$, $p = .019$), but no significant zero-order correlations were found between communication frequency and conscientiousness or neuroticism.

The maximum correlation between independent variables included in the analyses was .436, which is far below the upper limit of .7 recommended by Tabachnick and Fidell (2001:84) for the reduction of the risk of multicollinearity. As discussed in section 3.3.9, the independent variables were mean-centered before being entered into the regression equations.

6.3.2 Analysis for Dependent Variable LMX

LMX was found to be nonnormal (see section 3.3.7). Because skewness in the dependent variable can be a source of skewness in the residuals (Cohen et al., 2003: 246), the initial analysis was conducted with the transformed dependent variable $LMX^+ = \text{SQRT}(k - LMX)$ (see section 3.3.7). Analysis 6.1 was the initial analysis for the dependent variable LMX^+ and the independent variables gender, tenure, JD, CONSC, NEURO, WLCS and CF. In this analysis, the relationship between communication frequency and LMX, and the individual relationships and relative importance of conscientiousness, neuroticism and work locus of control with LMX was investigated. In analysis 6.2, the effect of the nonnormality of the independent variables JD, CONSC and CF on the results was investigated. In analysis 6.3, the analysis was repeated for the untransformed dependent variable LMX. In analysis 6.4, post hoc probing of the curvilinear relationship between conscientiousness and LMX was conducted, and the curve plotted.

Analysis 6.1

The control variables were entered in the first step to give model 67⁺. To test Hypothesis 46, the CF term was added to the equation to give model 68⁺. To test Hypotheses 47, 49 and 51, the CONSC, NEURO, and WLCS terms were individually added to model 67⁺ to give models 69⁺, 70⁺ and 71⁺, respectively. To check the relationship of each of the variables with LMX whilst partialing out the effect of the other variables, the three personality terms were added as a group to model 67⁺ to give model 72⁺. The results from the regression analysis are shown in tables 6.2 and 6.3.

TABLE 6.1 Bivariate Correlations for Gender, Tenure, Job Demand, CONSC, NEURO, WLCS, LMX and CF

Variable	1	2	3	4	5	6	7
1. Gender	-						
2. Tenure	.112	-					
3. Job Demand (JD)	-.020	-.019	-				
4. Conscientiousness (CONSC)	.086	-.061	-.065	-			
5. Neuroticism (NEURO)	.017	.045	.001	-.355***	-		
6. Work Locus of Control (WLCS)	-.070	.041	-.218*	.186*	-.113	-	
7. Leader-Member Exchange (LMX)	.023	-.062	.098	.274**	-.222*	.196*	-
8. Communication Frequency (CF)	-.023	-.022	.011	-.037	-.138	.212*	.436***

Tests of significance were two-tailed. $n = 128$. † $p < .1$, * $p < .05$, ** $p < .01$; and *** $p < .001$.

TABLE 6.2 Regression Analyses for Transformed Dependent Variable Leader Member Exchange (LMX⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 67 ⁺	Model 68 ⁺	Model 69 ⁺	Model 70 ⁺	Model 71 ⁺	Model 73 ⁺
	<i>B</i> (<i>s.e.</i>)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)
Constant	3.058*** (.111)	3.058*** (.100)	3.075*** (.107)	3.060*** (.109)	3.046*** (.108)	2.946*** (.126)
Gender	.062 (.313)	.093 (.283)	-.024 (.304)	.071 (.307)	.131 (.306)	-.003 (.301)
Tenure	.213 (.349)	.180 (.315)	.138 (.338)	.177 (.342)	.257 (.340)	.193 (.336)
Job Demand	-.007 (.007)	-.007 (.006)	-.008 (.007)	-.007 (.007)	-.011 (.007)	-.010 (.007)
CF		-.131*** (.025)	- -	- -	- -	- -
CONSC			-.056** (.019)	- -	- -	-.040 [†] (.020)
NEURO				.039* (.016)	- -	- -
WLCS					-.038** (.014)	- -
CONSC ²						.005 [†] (.002)
<i>F</i> value	.478	7.310***	2.689*	1.867	2.309 [†]	2.927*
Sig. <i>F</i> Change	.698	.000	.003	.016	.006	.059
<i>R</i> ²	.012	.199	.084	.060	.073	.111
<i>Adjusted R</i> ²	-.013	.171	.052	.028	.041	.073

Notes: *n* = 128; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 69⁺, 70⁺ and 71⁺, the significance of the *F* change is from model 67⁺.

For model 73⁺, the significance of the *F* change is from model 69⁺.

Transformed dependent variable LMX⁺ = SQRT (*k* - LMX).

[†] *p* < .1; * *p* < .05; ** *p* < .01; and *** *p* < .001.

TABLE 6.3 Regression Analyses for Transformed Dependent Variable Leader Member Exchange (LMX⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 67 ⁺	Model 72 ⁺	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>Beta</i> (β)
Constant	3.058*** (.111)	2.921*** (.123)	
Gender	.062 (.313)	.089 (.295)	.026
Tenure	.213 (.349)	.233 (.328)	.061
Job Demand	-.007 (.007)	-.013 [†] (.007)	-.170 [†]
CONSC		-.019 (.022)	-.091
CONSC ²		.005* (.002)	.204*
NEURO		.027 (.016)	.152
WLCS		-.030* (.013)	-.200*
<i>F</i> value	.478	3.375**	
Sig. <i>F</i> Change	.698	.000	
<i>R</i> ²	.012	.170	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable $LMX^+ = \text{SQRT}(k - LMX)$.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As predicted, communication frequency was found to be positively related to LMX (once the reflect element of the nonlinear transformation of LMX, $LMX^+ = \text{SQRT}(k - LMX)$, was allowed for) with an unstandardized coefficient of $B = -.131$ $p = .000$. The increase in the squared partial correlation R^2 from the base model of .189 indicates a moderate to large effect size. Hypothesis 46 is supported.

Conscientiousness was found to be positively related to LMX with an unstandardized coefficient of $B = -.056$, $p = .003$. However, when a quadratic term

CONSC² was added to model 69⁺ to give model 73⁺ (see table 6.3), it was found to result in a significant change to the F value ($p = .059$). In model 73⁺, the unstandardized coefficients for the CONSC and CONSC² terms were $B = -.040$, $p = .054$ and $B = .005$, $p = .059$, respectively. The increase in the squared partial correlation R^2 between models 69⁺ and 73⁺ was .021, which is above the lower cut off value of .020 suggested by Cohen et al. (2003: 212) for the acceptance of higher order terms in adjacent equations. In section 3.3.6, one case was found to have a z value of 3.92, and hence, was identified as a potential outlier. To confirm that the curvilinear relationship was not dependent on this case, the analysis was repeated with the case removed. The unstandardized coefficients for the CONSC and CONSC² terms were still both found to be significant ($B = -.049$, $p = .014$ and $B = .006$, $p = .077$, respectively). The increase in the squared partial correlation R^2 was .027, again above the lower limit recommended. These results suggest that the curvilinear relationship between conscientiousness and LMX was not dependent on the outlier.

Once the reflect element of the transformation of LMX⁺ is allowed for, the results indicate that the relationship between conscientiousness and LMX is curvilinear with a predominantly positive but concave downward sloping curve. The increase in the squared partial correlation R^2 , from model 67⁺ to model 73⁺, of .101 indicates a moderate effect size. As can be seen from the results in table 6.3, the curvilinear relationship was found to be significant, in model 72⁺, when the effects of neuroticism and work locus of control were controlled for. The unstandardized coefficient for the quadratic term CONSC² was $B = .005$, $p = .036$.

As predicted, neuroticism was found to be negatively related to LMX (once the reflect element of the nonlinear transformation of LMX, LMX⁺ = SQRT($k - \text{LMX}$), was allowed for) with an unstandardized coefficient of $B = .039$, $p = .016$. The increase in the squared partial correlation R^2 from model 67⁺, of .049 indicates a small effect size. Work locus of control was found to be positively related to LMX with an unstandardized coefficient of $B = -.038$ $p = .006$. The increase in the squared partial correlation R^2 from the base model of .062 again indicates a small effect size. Hypotheses 49 and 51 are supported.

The relative effects of the three personality variables can also be assessed from the value of their respective standardized coefficients in model 72⁺ (table 6.3). The relative importance of work locus of control over neuroticism is evident from their relative coefficients, ($\beta = -.200$, $p = .027$ and $\beta = .152$, $p = .101$, respectively). However, for the interpretation of the relative importance of the curvilinear conscientiousness term it should be noted that Jaccard and Turrisi (2003: 68) caution against the use of standardized coefficients in the analysis of interactions as there is the potential to misinterpret the results.

Of note is the result in model 72⁺, where job demand was found to have a significant unstandardized coefficient of $B = -.013$, $p = .055$, when all three personality

variables were controlled for. Adding the JD term to a model having controlled for gender, tenure, CONSC, CONSC², NEURO and WLCS resulted in a significant F change ($p = .055$) and an increase in the squared partial correlation R^2 of .032, indicating a small effect. Neither gender or tenure were significantly related to LMX.

Inspection of the P-P plot and the scatterplot of regression standardized residuals (see figures A-6.1 and A-6.2, respectively, in appendix 6.2) showed no violations of assumptions. The maximum value for the Variance Inflation Factor (VIF) in the analysis was 1.535, indicating multicollinearity was not a problem. The maximum Cook's distance and value of $DFBETA$ in this analysis were .150 and .011, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients.

Analysis 6.2

Of the independent variables included in this section, the variables JD, CONSC and CF were nonnormal. To check for the effects of the nonnormality of distribution of these variables, analysis 6.1 was repeated for the transformed variables JD⁺ and CF⁺ (see section 3.3.7) and the results between the two analyses compared. The transformed variable CONSC⁺ was not used as this would have removed the effect of the curvilinear relationship with LMX. The results were not materially different from those of analysis 6.1 (see tables A-6.2 and A-6.3 in appendix 6.2). Of note, however, is that job demand was found to be significant when work locus of control was controlled for in model 71⁺⁺ ($p = .073$), and was close to the cut-off value in model 73⁺⁺ ($p = .102$) when conscientiousness was controlled for. In model 72⁺⁺, job demand was found to be significantly related to LMX with an unstandardized coefficient of $B = -3.790$, $p = .035$, once neuroticism, work locus of control and conscientiousness were controlled for. Also of note is that in model 72⁺⁺ the significance of the coefficient for neuroticism was found to be at the upper level of significance ($p = .100$). Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results.

Analysis 6.3

For convenience of interpretation of the results, analysis 6.1 was repeated for the untransformed variable LMX. The results are shown in tables 6.4 and 6.5. As can be seen, the results are not materially different from those of the previous analyses. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results (values of 1.535, .34 and -.047, respectively).

TABLE 6.4 Regression Analyses for Dependent Variable Leader Member Exchange (LMX) and Independent Variables Gender, Tenure and Mean-Centered JD, CF, CONSC, NEURO and WLCS

Variable	Model 67	Model 68	Model 69	Model 70	Model 71	Model 73
	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	<i>B</i> (<i>s.e.</i>)
Constant	25.521*** (.683)	25.524*** (.617)	25.416*** (.660)	25.507*** (.669)	25.588*** (.668)	26.450*** (.764)
Gender	-.673 (1.932)	-.862 (1.745)	-.126 (1.872)	-.729 (1.892)	-1.067 (1.894)	-.293 (1.832)
Tenure	-1.504 (2.150)	-1.301 (1.942)	-1.030 (2.080)	-1.279 (2.108)	-1.755 (2.104)	-1.468 (2.042)
Job Demand	.045 (.042)	.043 (.038)	-.054 (.041)	.046 (.041)	.069 (.042)	-.066 (.040)
CF		.814*** (.154)	- -	- -	- -	- -
CONSC			.359** (.114)	- -	- -	.224 [†] (.124)
NEURO				-2.41* (.098)	- -	- -
WLCS					.219* (.085)	- -
CONSC ²						-.036* (.014)
<i>F</i> value	.574	7.508***	2.931*	1.970	2.102*	3.724**
Sig. <i>F</i> Change	.633	.000	.002	.015	.011	.013
<i>R</i> ²	.014	.203	.090	.063	.067	.137
Adjusted <i>R</i> ²	-.011	.176	.060	.031	.035	.100

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 69, 70 and 71, the significance of the *F* change is from model 67.

For model 73, the significance of the *F* change is from model 69.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 6.5 Regression Analyses for Dependent Variable Leader Member Exchange (LMX) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO and WLCS

Variable	Model 67	Model 72		Model 74	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>Beta</i> (β)	<i>B</i> (<i>s.e.</i>)	<i>Beta</i> (β)
Constant	25.521*** (.683)	26.601*** (.749)		26.233*** (.692)	
Gender	-.673 (1.932)	-.822 (1.801)	-.039	-.659 (1.654)	-.031
Tenure	-1.504 (2.150)	-1.683 (1.998)	-.072	-1.244 (1.838)	-.053
Job Demand	.045 (.042)	.083* (.040)	.178*	.069 [†] (.037)	.149 [†]
CONSC		.098 (.132)	.076	.213 [†] (.123)	.165 [†]
CONSC ²		-.039** (.014)	-.261**	-.027* (.013)	-.183*
NEURO		-.173 [†] (.099)	-.158 [†]	-.097 (.093)	-.088
WLCS		-.167* (.082)	.179*	.084 (.077)	.090
CF				.723*** (.153)	.386
<i>F</i> value	.574	3.869**		6.807***	
Sig. <i>F</i> Change	.633	.000		.000	
<i>R</i> ²	.014	.191		.323	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 6.4

The simple slopes were calculated by substituting the relevant coefficient values from model 74 (B_1 and B_2 refer to the unstandardized coefficients for the CONSC and CONSC² terms, respectively) and values for CONSC_L, CONSC_M and CONSC_H (corresponding to the mean value and values of \pm one standard deviation) into equation 6.1 (see Aiken & West, 1991: 64). The results are shown in table 6.6.

$$B_1 + 2 \times B_2 \times \text{CONSC} \quad (\text{Equation 6.1})$$

TABLE 6.6 Simple Slopes for the Equation for Curvilinear CONSC and LMX Relationship

	CONSC _L = -5.21	CONSC _M = 0	CONSC _H = 5.21
Simple Slope	.599	.224	-.151

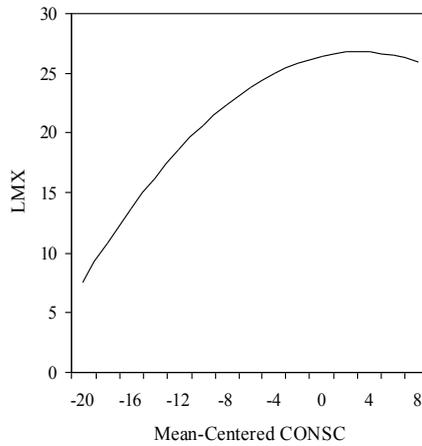
It can be seen from table 6.6 that the slope of the curve is upwards at low values of conscientiousness. As the mean value is approached, the slope becomes less steep. At a value of mean-centered CONSC of one standard deviation above the mean (5.21), the slope becomes downwards. The inflection point was calculated from equation 6.2 (see Aiken & West, 1991: 76) to be at 3.11. This corresponds to the maximum value for LMX.

$$X \text{ at } Y_{max} = \frac{-B_1}{2 \times B_2} \quad (\text{Equation 6.2})$$

To further assist with interpretation, the curve was plotted over the range of scores found in the sample for the equation corresponding to model 73 ($B_1 = .224, p = .073; B_2 = -.036, p = .013; B_0 = 26.450, p = .000$) for females (value = 0), tenure greater than three months (value = 0) and the mean value of job demand (value = 0 due to mean-centering). The plot is shown in figure 6.1. The plot for the curvilinear relationship was also made using the coefficients from model 74 (controlling for gender, tenure, job demand, neuroticism, work locus of control and communication frequency), which is shown in figure 6.2.

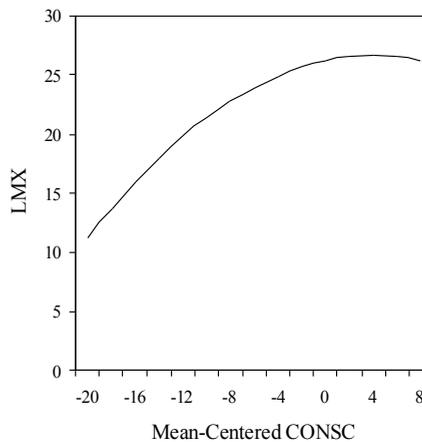
As can be seen from both plots, as conscientiousness increases, the quality of the LMX relationship increases until a maximum point is reached. At low levels of conscientiousness the slope is steeply upwards, while at higher levels it then becomes less steep and then flat. This suggests that conscientiousness is positively related to the quality of the leader-member relationship, but at higher values of conscientiousness is associated with a reduced rate of increase in the quality of the LMX relationship. Although the curve in figure 6.2 is slightly less pronounced, the effect can still be clearly observed.

FIGURE 6.1 Curvilinear Relationship between Conscientiousness (CONSC) and LMX



Note: Controlling for gender, tenure and job demand.

FIGURE 6.2 Curvilinear Relationship between Conscientiousness (CONSC) and LMX with Additional Control Variables



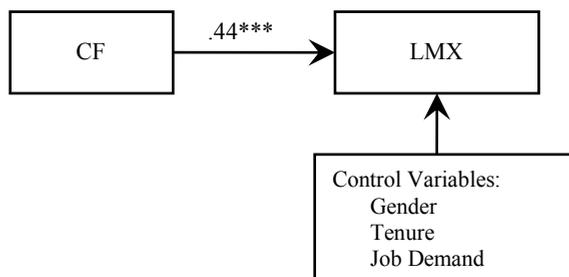
Note: Controlling for gender, tenure, job demand, neuroticism, work locus of control and communication frequency.

6.3.3 Summary of Results for Dependent Variable LMX

The results suggest that, in this study, communication frequency and work locus of control are positively related to LMX. Conscientiousness was found to have a curvilinear relationship with a predominantly positive, but concave downward-sloping curve. Neuroticism was found to be negatively related. The three traits of conscientiousness (both linear and curvilinear terms), neuroticism and work locus of control resulted in increases in the squared partial correlations R^2 of .125, .050, and .054, respectively, when added to the base model (controlling for gender, tenure and job demand). This indicates a moderate effect size for conscientiousness and small effect sizes for neuroticism and work locus of control. Hypotheses 47, 49 and 51 are supported. The increase in the squared partial correlation R^2 of .165, when the CF term was added to the base model, indicates a moderate effect size. Hypothesis 46 is supported.

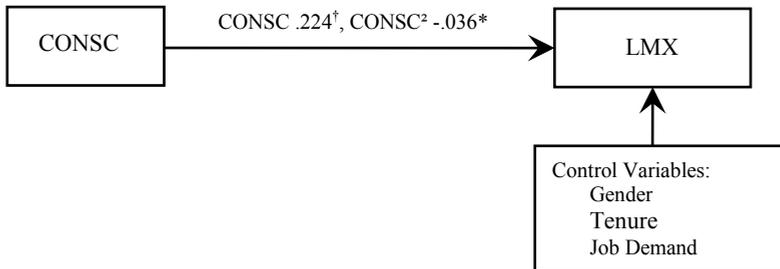
When LMX was regressed onto all three of the personality trait variables, while controlling for gender, tenure and job demand, the additional variance explained was 18.0%. All three personality traits were significantly related to LMX when the effects of the other two traits were controlled for. Neuroticism and work locus of control were found to have a similar level, but opposite effect on LMX, while conscientiousness was found to have a slightly larger effect. Job demand was found to be positively related to the quality of LMX relationship when the three personality traits were controlled for. The squared partial correlation R^2 of .036 when the JD term was added indicates a small effect size. The results are summarized in figures 6.3, 6.4, 6.5, 6.6, and 6.7.

FIGURE 6.3 Relationship between Communication Frequency and LMX



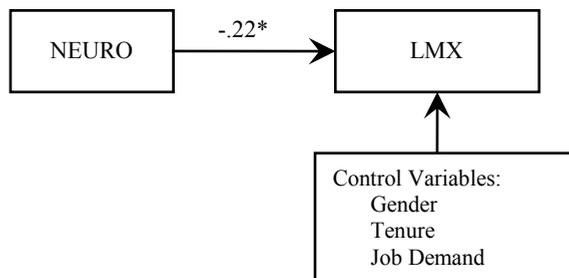
Notes: Standardized coefficients are shown.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

FIGURE 6.4 Relationship between Conscientiousness and LMX

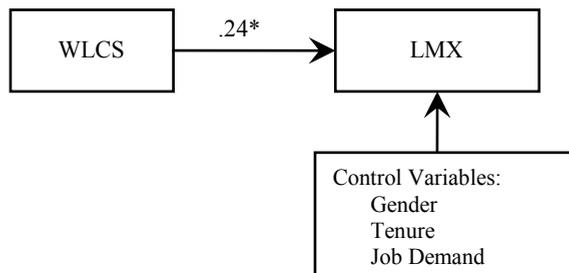
Notes: Unstandardized coefficients are shown for interaction terms to prevent misinterpretation of the results.

$^{\dagger} p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

FIGURE 6.5 Relationship between Neuroticism and LMX

Notes: Standardized coefficient is shown.

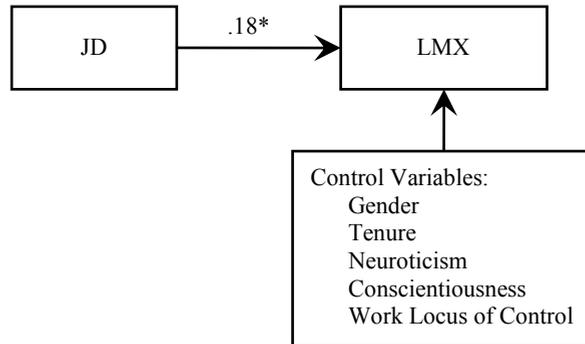
$^{\dagger} p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

FIGURE 6.6 Relationships between Work Locus of Control and LMX

Notes: Standardized coefficient is shown.

$^{\dagger} p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

FIGURE 6.7 Relationships between Job Demand and LMX



Notes: Standardized coefficient is shown.
[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

6.3.4 Analysis for Dependent Variable Communication Frequency

Communication frequency was found to be nonnormal (see section 3.3.7). For this reason, the initial analysis, analysis 6.5, was conducted with the transformed dependent variable $CF^+ = \text{LOG}(CF)$ (see section 3.3.7). This analysis included the independent variables gender, tenure, JD, CONSC, NEURO, WLCS and LMX. In analysis 6.6, the effect of the nonnormality of the independent variables of JD and CONSC on the results was confirmed. In analysis 6.7, the analysis was repeated for the untransformed variable CF, and the results were compared to the previous analyses.

Analysis 6.5

The control variables were entered in the first step to give model 75⁺. To confirm the relationship between LMX and communication frequency, the LMX term was added to the base model to give model 76⁺. To test Hypothesis 48, the CONSC term was added to model 75⁺, to give model 77⁺. To investigate the relationship between conscientiousness and communication frequency when the effects of LMX were controlled for, the LMX term was added to this model, to give model 78⁺. To test Hypothesis 50, the NEURO term was added to the base model, to give model 79⁺. To investigate the relationship between neuroticism and communication frequency when the effects of LMX were controlled for, the LMX term was added to this model, to give model 80⁺. To test Hypothesis 52, the WLCS term was added to the base model to give model 81⁺. To confirm the relationship when LMX was partialled out, the LMX term was added to the equation in model 82⁺. To investigate the relative effects of the three personality variables on communication frequency, the three independent personality variables were added to the base model to give model 83⁺. To compare the contributions of the personality variables and leader member exchange, the LMX term was then added to this model to give model 84⁺. The results are shown in tables 6.7 and 6.8.

TABLE 6.7 Regression Analyses for Transformed Dependent Variable Communication Frequency (CF⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX

Variable	Model 75 ⁺	Model 76 ⁺	Model 77 ⁺	Model 78 ⁺	Model 79 ⁺	Model 80 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	.970*** (.016)	.968*** (.014)	.970*** (.016)	.969*** (.014)	.970*** (.016)	.968*** (.014)
Gender	.010 (.044)	.017 (.039)	.009 (.045)	.011 (.039)	.009 (.044)	.017 (.040)
Tenure	-.003 (.049)	.014 (.044)	-.003 (.050)	.009 (.044)	.000 (.049)	.014 (.044)
Job Demand	.000 (.001)	.000 (.001)	.000 (.001)	.000 (.001)	.000 (.001)	.000 (.001)
CONSC		- - (.003)	.000 (.003)	-.005 [†] (.002)	- -	- -
NEURO		- -		- -	-.003 (.002)	-.001 (.002)
WLCS		- -		- -		- -
LMX		.011*** (.002)		.012*** (.002)		.011*** (.002)
<i>F</i> value	.080	8.329***	.067	7.515***	.544	6.629***
Sig. <i>F</i> Change	.971	.000	.866	.000	.167	.000
<i>R</i> ²	.002	.220	.002	.243	.018	.221

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 77⁺ and 79⁺, the significance of the *F* change is from model 75⁺.

Transformed dependent variable CF⁺ = LOG (CF).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 6.8 Regression Analyses for Transformed Dependent Variable Communication Frequency (CF⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX

Variable	Model 81 ⁺	Model 82 ⁺	Model 83 ⁺		Model 84 ⁺	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	β	<i>B</i> (<i>s.e.</i>)	β
Constant	.972*** (.016)	.969*** (.014)	.972*** (.015)		.970*** (.014)	
Gender	.002 (.044)	.013 (.040)	-.004 (.044)	-.008	.003 (.039)	-.006
Tenure	-.008 (.049)	.010 (.044)	-.009 (.049)	-.016	.005 (.044)	.009
Job Demand	.001 (.001)	.000 (.001)	.001 (.001)	.079	.000 (.001)	.007
CONSC	- -	- -	-.003 (.003)	-1.106	-.006* (.003)	-.201*
NEURO	- -	- -	-.004 (.002)	-1.140	-.002 (.002)	-.078
WLCS	.005* (.002)	.002 (.002)	.005* (.002)	.215*	.003 (.002)	.128
LMX		.010*** (.002)			.011*** (.002)	.480***
<i>F</i> value	1.368	7.003***	1.329		5.867***	
Sig. <i>F</i> Change	.024	.000	.057		.000	
<i>R</i> ²	.044	.230	.064		.263	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 81⁺ and 83⁺, the significance of the *F* change is from model 75⁺.

Transformed dependent variable CF⁺ = LOG (CF).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As previously, the relationship between LMX and communication frequency was found to be positive with the LMX term having an unstandardized coefficient in model 76⁺ of $B = .011$, $p = .001$. The increase in the squared partial correlation R^2 between this model and the base model was .22, which indicates a large effect size. In model 77⁺, the CONSC term was found to have a nonsignificant unstandardized coefficient ($p = .866$). However, when the quality of the LMX relationship was controlled for by adding the

LMX term to model 77⁺ to give model 78⁺, the CONSC term had a significant unstandardized coefficient ($B = -.005, p = .062$). Although not shown, the analysis was also repeated with the potential outlier removed. The results were not materially affected. The unstandardized coefficient for the CONSC term in model 78⁺ with the outlier removed was not materially different from previously ($B = -.005, p = .043$, compared to $B = -.005, p = .062$, previously). Hypothesis 48 is not supported. It is concluded that conscientiousness is negatively related to communication frequency, but only when the effects of LMX are controlled for. The increase in the squared partial correlation R^2 when the CONSC term was added to a model containing gender, tenure, JD and LMX, was .029, which indicates a small effect size.

Neuroticism was not found to be related to communication frequency as the coefficient for the NEURO term was nonsignificant ($p = .167$). This was still the case when the quality of the LMX relationship was controlled for in model 80⁺ ($p = .770$) Hypothesis 50 is not supported. As predicted, internality of work locus of control was positively related to communication frequency. In model 81⁺, the unstandardized coefficient for the WLCS term was $B = .005, p = .024$. The increase in the squared partial correlation R^2 when the WLCS term was added to model 75⁺ was .042, which indicates a small effect size. When the LMX term was added to model 81⁺ to give model 82⁺, the coefficient of the WLCS term became nonsignificant ($p = .216$). According to Baron and Kenny (1986), a variable is a mediator if:

1. there is a significant relationship between the independent variable and the dependent variable. In this case, work locus of control was found to be positively and significantly related to communication frequency ($B = .005, p = .024$, model 81⁺).
2. there is a significant relationship between the independent variable and the mediator. In the previous section, work locus of control was found to be positively and significantly related to LMX ($B = .183, p = .030$).
3. the mediator still predicts the dependent variable after controlling for the independent variable. LMX was still positively related to communication frequency ($B = .010, p = .001$) after controlling for work locus of control (model 82⁺).
4. the relationship between the independent variable and the dependent variable is reduced when the mediator is in the equation. Mediation is said to be full when the relationship becomes nonsignificant when the mediator is entered (Baron & Kenny, 1986; Hair et al., 2006: 844). When the LMX term was added to model 81⁺, the significance of the work locus of control term coefficient changed from $p = .024$ to $p = .216$ (model 82⁺).

To test the significance of the mediation, a Sobel test was conducted. The Sobel test statistic was calculated to be 2.23, $p = .026$. From a bootstrap analysis (see section 3.3.4) the 95% (two-tailed) confidence limits were calculated to be .0001 to .0045. As there is

no zero in this range, it is concluded that the indirect effect of WLCS on CF⁺ is significantly different from zero, and LMX mediates work locus of control in its relationship with communication frequency. Hypothesis 52 and 53 are supported.

In model 83⁺, when all the three personality variables were independent added to the base model, only work locus of control was found to significantly predict communication frequency ($\beta = .215, p = .024$). When the LMX term was added to this model, both conscientiousness and LMX were found to be significantly related to communication frequency ($p = .026$ and $p = .001$, respectively). The relative importance of each of these variables can be seen from the examination of the beta coefficients. The advantage of beta coefficients is that they reflect the relative impact on the dependent variable of a change of one standard deviation of the independent variables (Hair et al., 2006: 226). Conscientiousness had a coefficient of $\beta = -.201$ compared to LMX $\beta = .480$. From this it can be seen that the personality trait of conscientiousness has a smaller negative impact than the positive effect of LMX on levels of communication frequency.

Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions (see figures A-6.3 and A-6.4, respectively, in appendix 6). Inspection of the Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results (maximum values in the analysis of 1.241, .102 and .026, respectively).

Analysis 6.6

To check for the effects of the nonnormality of distribution of the variables of JD, CONSC and LMX on the results, the analysis was repeated using the transformed variables JD⁺, CONSC⁺ and LMX⁺ (see section 3.3.7) and the results were compared to the previous analysis. Once the reflect element of the transformations of the variables CONSC⁺ and LMX⁺ had been allowed for, no material differences were observed (see tables A-6.4 and A-6.5 in appendix 6.2). The four conditions for confirmation of mediation of work locus of control by LMX in its relationship with communication frequency were again met. The Sobel test statistic was calculated to be 2.33, $p = .002$ which confirms the mediation effect. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results.

Analysis 6.7

The analysis was repeated for the untransformed variable CF and the results compared to the previous analyses. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated a slight violation of the assumption of normality of the standardized residuals (see figures A-6.5 and A-6.6, respectively, in

appendix 6.2). However, as can be seen from tables 6.9 and 6.10, very little change in the results was observed, despite the lack of normality of the dependent variable CF.

TABLE 6.9 Regression Analyses for Dependent Variable Communication Frequency (CF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX

Variable	Model 75	Model 76	Model 77	Model 78	Model 79	Model 80
	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	<i>B</i> (<i>s.e.</i>)
Constant	9.948*** (.367)	9.899*** (.331)	9.956*** (.369)	9.928*** (.328)	9.944*** (.365)	9.898*** (.332)
Gender	.232 (1.038)	.390 (.938)	.193 (1.046)	.226 (.929)	.213 (1.032)	.381 (.941)
Tenure	-.249 (1.155)	.104 (1.045)	-.283 (1.162)	-.014 (1.034)	-.175 (1.150)	.119 (1.049)
Job Demand	.002 (.023)	-.008 (.021)	.002 (.023)	-.012 (.020)	.003 (.023)	-.008 (.021)
CONSC		-	-.025 (.064)	-.119* (.059)	-	-
NEURO		-		-	-.080 (.053)	-.024 (.050)
WLCS		-		-		-
LMX		.235*** (.044)		.260*** (.046)		.230*** (.046)
<i>F</i> value	.041	7.017***	.070	6.568***	.592	5.626***
Sig. <i>F</i> Change	.989	.000	.693	.000	.137	.000
<i>R</i> ²	.001	.192	.002	.219	.020	.194

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 77 and 79, the significance of the *F* change is from model 75

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 6.10 Regression Analyses for Dependent Variable Communication Frequency (CF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX

Variable	Model 81	Model 82	Model 83		Model 84	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	β	<i>B</i> (<i>s.e.</i>)	β
Constant	9.983*** (.360)	9.922*** (.330)	10.006*** (.358)		9.963*** (.324)	
Gender	.030 (1.020)	.264 (.937)	-.142 (1.021)	-.013	.006 (.925)	.001
Tenure	-.378 (1.133)	.007 (1.042)	-.420 (1.130)	-.034	-.128 (1.025)	-.010
Job Demand	.015 (.023)	.000 (.021)	.013 (.023)	.052	-.004 (.021)	-.015
CONSC	- -	- -	-.094 (.067)	-.137	-.155* (.062)	-.225*
NEURO	- -	- -	-.093 (.056)	-.159	-.059 (.051)	-.101
WLCS	.112* (.046)	.064 (.043)	.116* (.047)	.233*	.076 [†] (.043)	.152 [†]
LMX		.219*** (.045)			.238*** (.046)	.446***
<i>F</i> value	1.528	6.112 ***	1.620		5.447***	
Sig. <i>F</i> Change	.016	.000	.026		.000	
<i>R</i> ²	.049	.207	.077		.249	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 81 and 83, the significance of the *F* change is from model 75.

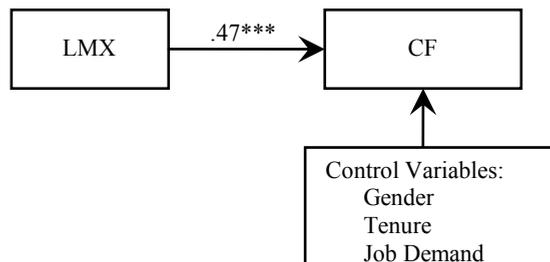
[†] $p < .1$; * $p < .05$; ** $p < .01$ and *** $p < .001$.

The only material changes were a slight decline in R^2 values for the models including the relevant LMX terms and that the WLCS term in model 84 was now significant ($p = .081$) compared to being nonsignificant previously ($p = .137$ and $p = .136$, in models 84⁺ and 84⁺⁺, respectively). Inspection of Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results (maximum values in the analysis of 1.241, .178 and .160, respectively).

6.3.5 Summary of Results for Dependent Variable Communication Frequency

The results of this section indicate that, in this study, LMX is positively related to communication frequency with a large effect size (the increase in the squared partial correlation R^2 was .220). Conscientiousness was found to be negatively related to communication frequency rather than positively, as predicted. Hypothesis 48 is rejected. This was only the case once the quality of the LMX quality was controlled for. The effect size was small (the increase in the squared partial correlation R^2 was .029). Neuroticism was not found to significantly predict communication frequency. Hypothesis 50 is not supported. Work locus of control was found to be positively related to communication frequency with a small effect size (the increase in the squared partial correlation R^2 was .042). Hypothesis 52 is supported. Individuals with a high level of work locus of control (internal individuals) are likely to communicate more frequently with their managers. This relationship was found to be fully mediated by the quality of the LMX relationship. Neither of the control variables or job demand were found to significantly predict communication frequency.

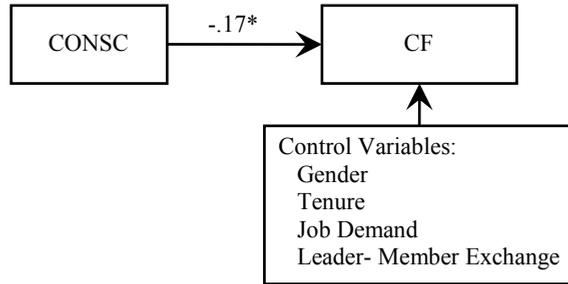
FIGURE 6.8 Relationship between LMX and Communication Frequency



Notes: Standardized coefficient is shown.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

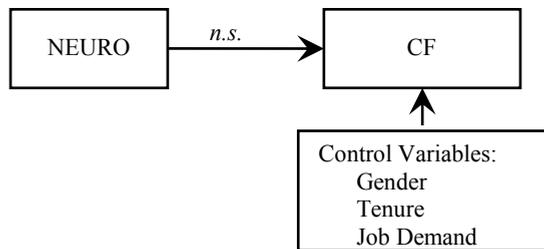
FIGURE 6.9 Relationship between Conscientiousness and Communication Frequency



Notes: Standardized coefficient is shown. The relationship between conscientiousness and communication frequency is only significant when LMX is controlled for.

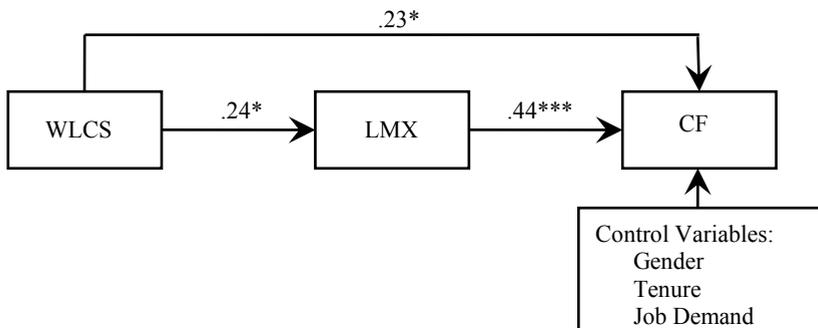
$^\dagger p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

FIGURE 6.10 Relationships between Neuroticism and Communication Frequency



Notes: $n.s.$ indicates nonsignificance.

FIGURE 6.11 Relationships between Work Locus of Control, LMX and Communication Frequency



Notes: Standardized coefficients are shown. LMX fully mediates the relationship between work locus of control and communication frequency.

$^\dagger p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

6.4 DISCUSSION

6.4.1. Communication and LMX

The positive relationship previously found between communication frequency and LMX (see, for example, Bauer et al., 1996; Kramer, 1995) was confirmed in this study. While LMX theory suggest that intra-dyadic communication is essential for the development of high-quality leader member-exchange relationships and communication is the vehicle through which leaders and followers nurture and maintain their relationships (Graen & Uhl-Bien, 1995), it must be noted that this study is cross-sectional in design. So no conclusions can be drawn about causality. However, the statement by Bauer et al. (2006), that high-quality exchanges are characterized by frequent communication, is supported, as LMX was found to have a large effect size on communication frequency, with an additional 22% of variance explained.

6.4.2. Personality and LMX

The aim was to investigate the roles and relative importance of the personality factors of conscientiousness, neuroticism and work locus of control as antecedent factors to LMX quality. When LMX was regressed onto all three of the personality trait variables, while controlling for gender, tenure and job demand, all three were found to significantly predict LMX, and the additional variance explained was 18.0%. Conscientiousness was found to be the most important trait, which was related to LMX with a curvilinear relationship with a predominantly positive, concave, downward-sloping trend. Work locus of control was also positively related to LMX, while neuroticism was found to be negatively related. The findings of this study indicate that the level of follower conscientiousness, neuroticism and work locus of control are important antecedent factors for the determination of their perception of the quality of their LMX relationship with their manager.

The correlation between conscientiousness and LMX was found to be in the same direction, but higher than the average value calculated by Lapierre and Hackett (2007) ($r = .27$, $p < .01$, $r = .05$, $p < .001$, respectively). This provides further support for the influence of weak environmental conditions influencing the strength of the relationships found between personality and the work outcomes in this study in that, as asserted by Barrick et al. (2005), individuals will behave more in line with their personality traits when conditions are weak. No prior studies were available on the strength of the correlation between neuroticism and LMX, so no comparison could be made.

For work locus of control, the results were of the same direction and similar magnitude to the previous research of both locus of control and work locus of control, and LMX. While noting that in the study of Phillips and Bedeian (1994) the correlation did not reach an acceptable level of significance ($p > .05$), the correlation in this study was similar to that of Kinicki and Vecchio (1994) and Phillips and Bedeian (1994) ($r = .20$, $p < .05$, $r = .14$, $p > .05$, and $r = .32$, $p < .01$, respectively). The standardized

coefficients for the regression of LMX on work locus of control were also smaller than those reported for two samples in the study of Martin et al. (2005), where the work locus of control was measured using only the eight-items of Spector's WLCS scale relating to personal control ($\beta = .24, p < .001$, and $\beta = .39, p < .001$ for sample 1; and $\beta = .44, p < .01$ for sample 2, respectively). Although not shown, the standardized coefficient for the personal control factor of the work locus of control scale (see section 3.2.6) in this study was smaller ($\beta = .19, p = .037$). These results support the suggestion of Durand and Nord (1976) that locus of control is an important factor in predicting the quality of relationships between subordinates and supervisors.

When LMX was regressed separately on each of the personality trait variables while controlling for gender, tenure and job demand, the effect size for conscientiousness was found to be moderate (increase in the squared partial correlations R^2 of .125), while the effect sizes of neuroticism and work locus of control were found to be small (increase in the squared partial correlations R^2 of .050 and .054, respectively). The importance of conscientiousness in the prediction of LMX is interesting. It suggests that more conscientious individuals will enjoy more positive working relationships with their manager, and as it is reasonable to expect that managers will value positive relationships with their employees, gain significant benefits from them and it is likely that the relationship will be reciprocal, this may be a factor in why conscientiousness has been found to be the most important personality trait managers consider when making employment decisions (Dunn et al., 1995). The fact that conscientiousness was found to be curvilinear in its relationship with LMX is also interesting (see figure 6.4). It appears that as conscientiousness increases, the quality of the LMX relationship will increase. However, the rate of increase declines; until at the top of the range of conscientiousness found in this study, the rate is almost flat. A possible explanation for this effect could be that the characteristics associated with conscientiousness which contributes to their manager's perception of their levels of investment, contribution and professional capabilities initially make a large difference to the quality of the relationship. However, at higher levels of LMX perhaps the interpersonal factors of loyalty and affect proposed by Dienesch and Liden (1986) become more important, and as conscientiousness is not associated with the facets and behaviours that will be of primary influence for interpersonal factors, it may be that further increases of conscientiousness will not be associated with increases in LMX.

A weakness of this study is that the measures of personality traits and the perceived quality of LMX with their manager were both collected from the individual. As such the effects of their personality on their perceptions must be considered. LMX is an exchange theory of leadership and assumes that, over time, the relationship between the individual and their manager will reach an equilibrium state, with balanced reciprocity (Bower et al., 2000). As the dyadic relationship is the focus of analysis, and LMX is defined as the measure of the quality of the exchange relationship, the theory appears to

predict that the relationship has a reality of its own: there should be no difference between the individual's or the manager's or a third party's perception of the quality of the exchange. However, as an individual's perceptions are influenced by their personality (Mount et al., 2005), it can be expected that different individuals will make different perceptions of their shared leadership relationships. This has been confirmed by prior research. Durand and Nord (1976) found that the personality of the follower was a major factor in predicting leadership behaviour as perceived by the follower. More recently, in a laboratory study, Ehrhart and Klein (2001) found that followers differ in their perceptions and interpretations of identical leader behaviours, and have different preferences of leadership styles. Also, Schyns and Sanders (2007) found that follower personality was related to perceptions of transformational leadership. Prior research has found that the correlation between LMX measured from the member's perspective and the leader's perspective, is lower than might be expected. For example, prior studies by Gerstner and Day (1997) and Greguras and Ford (2006) found correlations of $r = .29$ and $r = .40$, respectively. Although it has been suggested that LMX is more reliably assessed from the member's perspective (Gerstner & Day, 1997), it would have been an improvement to have measured the quality of the LMX relationship from the perspective of the manager as well.

One argument that the influence of the individual's personality traits on their perceptions of the quality of LMX may not be the main reason for the findings, is provided by the fact that the theory considered in the generation of the hypotheses relies heavily on considerations of the influences of follower personality on their behaviours and actions, and how these actions and behaviours will be perceived by the manager. Further, the direction and magnitude of the results for all three personality factors are consistent with those of the limited number of prior studies available (although both the studies of Kinicki and Vecchio (1994) and Martin et al. (2005) suffer from the same problem). As individuals high in neuroticism tend to view the world through a negative lens (Bono & Judge, 2004), it could be expected that this effect would be most pronounced for the case of neuroticism. The fact that all three personality traits still predicted LMX quality when the other two traits were controlled for provides some further reassurance. It is concluded that the three personality traits of conscientiousness, neuroticism and work locus of control in individuals are important antecedent factors in the prediction of their perception of the quality of their LMX relationship with their managers.

6.4.3. Job Demand and LMX

Although no hypothesis was proposed for the relationship between job demand and LMX, an interesting finding is that the significance of the prediction of LMX by job demand changed from $p = .287$ to $p = .043$ when the three personality variables were controlled for. The relationship was found to be positive with a small effect size

(additional variance of 3.6% explained above that of the three personality variables and the two controls). Previous research by Kinicki and Vecchio (1994) also suggested that demands faced by managers are positively associated with LMX quality. In a study of 24 bank branch managers and 138 loan officers, they found that the level of time-pressure faced by managers (as perceived by the manager) was positively related to the level of LMX (as perceived by the follower). Their findings led them to suggest that “when under pressure, leaders and members can develop stronger working relationships” (Kinicki & Vecchio, 1994: 80). The positive relationship between job demand and LMX found in this study supports this suggestion, and can be explained by consideration that, when under pressure, managers will have a greater incentive to form high-quality exchange relationships with their subordinates. As managers have limited time and resources, and can only develop a limited number of high-quality exchanges with a few subordinates (Graen & Uhl-Bien, 1995), it is reasonable to expect they will invest only in those subordinates who are more ready to form relational contracts, and who will provide the highest levels of benefit to them. As such, this finding provides further support for the importance of the three personality factors as antecedent factors of the quality of LMX relationships. The finding is particularly impressive when it is considered that the data for the LMX relationship was collected from the individual and the job demand measure was based on hard performance statistics. The finding also provides further support of the effectiveness of the measure of performance (see section 3.2.7) adopted as the proxy for job demand.

6.4.4. Personality and Communication Frequency

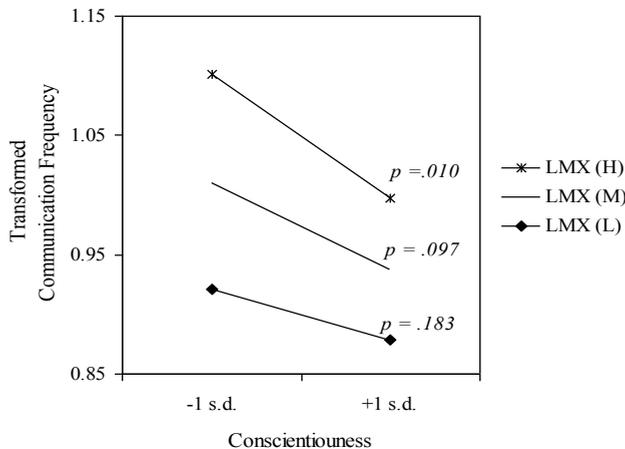
A further aim of this study was to investigate the influence of the three personality factors on communication frequency. The results were not as hypothesized except in the case of work locus of control, which as predicted, positively related to communication frequency. Also as predicted, the relationship between work locus of control and communication frequency was fully mediated by the quality of the LMX relationship. Neuroticism was not found to significantly predict communication frequency, whilst conscientiousness was found to significantly predict communication frequency, but only when LMX quality was controlled for. The relationship was found to be negative, which is the opposite of the proposed hypothesis. The effect sizes for both conscientiousness and work locus of control were small (additional variance explained of 2.9% and 4.2%, respectively).

The hypothesis for the positive relationship between conscientiousness and communication frequency was based upon the expectation of a positive relationship between conscientiousness and LMX, and LMX and communication frequency, and the argument that active seeking of feedback by an individual is a central part of the process of self-regulation of individuals (Ashford & Tsui, 1991; Barner-Rasmussen, 2003). An implicit assumption made was that conscientious individuals would engage in more self-

regulation than individuals low in conscientiousness. A possible explanation for the negative relationship can be suggested from a further examination of the facets of conscientiousness, in particular those of deliberation and competence (Costa et al., 1991). It may be that individuals who have higher levels of deliberation (levels of caution, planning and thoughtfulness) may be inclined to communicate less frequently with their manager. Further, individuals who have higher levels of competence (levels of capability, sensibility and accomplishment) may feel that they need to talk to their managers less frequently than those who have lower levels of competence, in that they may require less guidance or direction. It may also be true that managers feel that they need to communicate less frequently with individuals who they perceive as able to cope in their assigned roles, duties and tasks.

Although not shown in the analysis, there was some evidence of an interaction between conscientiousness and LMX quality in the prediction of communication frequency. The interaction term was found to be close to the upper level of significance ($p = .097$) when the transformed dependent variable was regressed onto conscientiousness and LMX, but was nonsignificant ($p = .130$) when the analysis was repeated to assess the nonnormality of the independent variables on the analysis. The results for the analysis including the nonnormal independent variables are shown in figures 6.12 and 6.13.

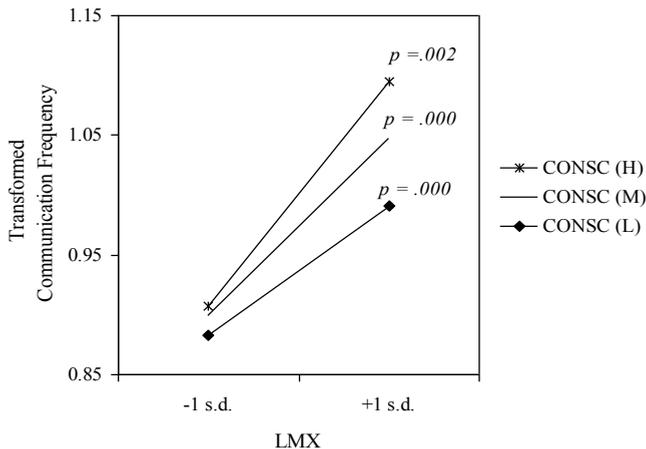
FIGURE 6.12 Interaction between Conscientiousness and LMX (LMX_H, LMX_M and LMX_L) predicting Communication Frequency



As can be seen from figure 6.12, higher-quality LMX relationships are associated with higher levels of communication frequency at all levels of conscientiousness. The slope of the lines for high-quality LMX and mean-quality LMX were significant ($p = .010$ and $p = .097$, respectively), while the slope for low-quality LMX was non-

significant ($p = .183$). This suggests that in high-quality LMX relationships, as conscientiousness increases, the rate of decline in communication frequency decreases significantly, while in low-quality LMX relationships, communication frequency does not significantly change as conscientiousness increases.

FIGURE 6.13 Interaction between Conscientiousness and LMX (CONSC_H, CONSC_M and CONSC_L) predicting Communication Frequency



As can be seen from figure 6.13, as the quality of the LMX relationship increases, the level of communication frequency increases for all levels of conscientiousness. All three slopes (CONSC_H, CONSC_M and CONSC_L) were found to be significantly different from zero ($p = .002$, $p = .000$ and $p = .000$, respectively). As high-quality LMX relationships are characterized by high levels of mutual trust (Brower, Schoorman & Tan, 2000; Graen & Uhl-Bien, 1995; Schriesheim et al., 1999), the slope for the high-quality LMX relationships being less steep than that for the low-quality LMX relationships is consistent with the argument presented earlier, that managers who judge individuals as competent will communicate less frequently with them.

6.4.5. Conclusions

The findings support follower conscientiousness, neuroticism and work locus of control as important antecedent factors for an individual's perception of the quality of their LMX relationship with their manager, and influencing the communication frequency between them. Conscientiousness seems to be the most important trait for the perception of a high-quality LMX relationship, and was negatively related to communication frequency. The finding of the positive relationship between conscientiousness and LMX quality is consistent with the prior research showing that

conscientiousness is a strong predictor of performance, being the most important trait considered by managers in making employment decisions (Dunn et al., 1995).

CHAPTER 7

THE IMPACT OF CONSCIENTIOUSNESS, NEUROTICISM, WORK LOCUS OF CONTROL, LMX AND COMMUNICATION FREQUENCY ON THE PERSONAL OUTCOMES OF BURNOUT AND OCCUPATIONAL SELF-EFFICACY

7.1 INTRODUCTION

In chapter 4, LMX was found to be an important factor in the prediction of both burnout and occupational self-efficacy, and communication frequency was found to predict burnout and the components of emotional exhaustion and depersonalization, as well as occupational self-efficacy. In chapter 5, conscientiousness, neuroticism and work locus of control were found to be important predictors of burnout and the three components, and of occupational self-efficacy. In this chapter, the relative effects on burnout (and the three components) and occupational self-efficacy are investigated.

In chapter 6, the follower personality traits of conscientiousness, neuroticism and work locus of control were found to significantly predict follower perceptions of LMX quality. Whether the quality of LMX is an interpersonal mechanism that mediates the relationship between each of the three personality traits and the personal outcomes of burnout (and the three components) and occupational self-efficacy is also investigated.

In addition, whether the linear LMX, curvilinear communication frequency, and the linear LMX and curvilinear communication frequency interaction of both burnout and emotional exhaustion, found in chapter 4, is still significant is investigated. Finally, whether the three-way interaction between conscientiousness, neuroticism and work locus of control in the prediction of occupational self-efficacy, found in Chapter 5, is still significant when LMX and communication frequency are controlled for is also examined.

7.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES

LMX theory posits that the quality of the LMX relationship with their manager will have important outcomes for individuals (Greguras & Ford, 2006). LMX has been found to influence employee perceptions of the work place and to influence their attitudes (see, for example, Erdogan et al., 2006; Wayne et al., 1997). It is increasingly being examined as a process that impacts on outcomes for individuals (Davis & Gardner, 2004). As mentioned above, LMX has previously in this study been found to be significantly related to burnout and its three components, as well as to occupational self-efficacy (see chapter 4). Conscientiousness, neuroticism and work locus of control have also been found previously in this study to have significant relationships with burnout and the three components (except in the case of neuroticism, where the support was limited), and with occupational self-efficacy (see chapter 5). In addition, the three traits have been

found to significantly predict LMX (see chapter 6). As argued in chapter 6, the three personality factors of conscientiousness, neuroticism and work locus of control will affect the relationships that individuals establish with their manager both through the type of contact they are predisposed to enter into, and the perceptions of their manager in terms of the level of investment and contribution to the exchange relationship, and in terms of their professional capabilities. Individuals in high-quality LMX relationships will be provided with key information, emotional support, and other important resources by their managers. As such, it is expected that individuals in high-quality LMX relationships will experience a further reduction in the levels of burnout and an increase in their levels of occupational self-efficacy. Similarly, low-quality LMX relationships will play a mediating role in the relationship between the personality traits, on the one hand with burnout, and on the other hand with occupational self-efficacy. Individuals in low-quality LMX relationships will have lower levels of resources and support available to them, which is likely to further adversely affect their perceptions of challenges in the work place, and their judgments of their capabilities and resources.

Prior research has supported the role of LMX as a mediator of personality traits, and of an individual's attitudes and other outcomes. Kinicki and Vecchio (1994) found that LMX mediated the relationship between an individual's locus of control and their level of organizational commitment. Martin et al. (2005) found that LMX mediated the relationship between work locus of control and organizational commitment, job satisfaction and work related well-being. Thus, the following hypotheses are proposed for investigation:

- Hypothesis 54** *Leader-member exchange mediates the relationship between conscientiousness and burnout and each of the three components.*
- Hypothesis 55** *Leader-member exchange mediates the relationship between neuroticism and burnout and each of the three components.*
- Hypothesis 56** *Leader-member exchange mediates the relationship between work locus of control and burnout and each of the three components.*
- Hypothesis 57** *Leader-member exchange mediates the relationship between conscientiousness and occupational self-efficacy.*
- Hypothesis 58** *Leader-member exchange mediates the relationship between neuroticism and burnout and occupational self-efficacy.*
- Hypothesis 59** *Leader-member exchange mediates the relationship between work locus of control and burnout and occupational self-efficacy.*

7.3 ANALYSIS AND RESULTS

7.3.1 Initial Analysis

To check whether common-method variance was an issue, a Harmon One-Factor test for each of the analyses was conducted. For the burnout, emotional exhaustion, depersonalization, reduced personal accomplishment and occupational self-efficacy analyses, the first factor extracted accounted for 16.2% 17.4%, 16.5%, 16.3% and 17.9%, respectively. As no single factor emerged from the factor analyses and one general factor was not found to account for the majority of the covariance, it is indicated that common-method variance is not a pervasive problem.

An important assumption of linear regression is that of linearity in the variables (Cohen et al., 2003: 118). Darlington (1991; cited in Cohen et al., 2003: 213) warns that nonlinear relationships between independent variables may cause difficulties in linear regression analysis. As it had previously been found that the relationship between conscientiousness and LMX was curvilinear (see section 6.3.2) when both of these variables were in the equation, checks were conducted to see if nonlinearity had affected the results. This was done by following the advice of Cohen et al. (2003: 142) to transform the variables by taking their logs before repeating the analysis.

7.3.2 Analysis for Dependent Variable Emotional Exhaustion

As previously, to minimize skewness in the residuals the initial analysis was conducted for the transformed dependent variable $EE^+ = \text{SQRT}(EE)$. In analysis 7.1, it was examined whether LMX mediated the relationships between each of the personality variables and emotional exhaustion. In analysis 7.2, the effect of the nonnormality of the variables JD, CONSC and LMX on the results of the mediation analysis was checked. In analysis 7.3 the relative importance of each of the independent variables to emotional exhaustion was confirmed. In analysis 7.4, it was investigated whether the moderation of the curvilinear relationship of communication frequency with emotional exhaustion by LMX was still significant when the effects of the personality variables were partialled out. In analysis 7.5, the analysis was repeated for the untransformed dependent variable emotional exhaustion.

Analysis 7.1

To test whether LMX acted as a mediator for conscientiousness, neuroticism and work locus of control, the LMX term was added to each of the models 29⁺, 30⁺ and 31⁺, to give models 85⁺, 86⁺ and 87⁺. The results are shown in table 7.1.

According to Baron and Kenny (1986), a variable is a mediator if:

1. there is a significant relationship between the independent variable and the dependent variable. As previously, conscientiousness, neuroticism and work locus of control were found to be significantly related to emotional exhaustion ($B = -.066, p = .001$, $B = .090, p = .000$, and $B = -.050, p = .000$, respectively).

2. there is a significant relationship between the independent variable and the mediator. Conscientiousness, neuroticism and work locus of control were found to be significantly related to LMX ($B = .359, p = .002$, $B = -.241, p = .015$, and $B = .219, p = .011$, respectively) (see chapter 6).
3. the mediator still predicts the dependent variable after controlling for the independent variable. As can be seen in table 7.1, LMX still predicted emotional exhaustion after each of conscientiousness, neuroticism and work locus of control were controlled for ($B = -.030, p = .044$, $B = -.025, p = .063$, and $B = -.032, p = .032$, respectively).
4. the relationship between the independent variable and the dependent variable is reduced when the mediator is added to the equation. When the LMX term was added to the respective models, the unstandardized coefficients of all three terms reduced (CONSC from $B = -.066$ to $B = -.055$, NEURO from $B = .090$ to $B = .084$ and WLCS from $B = -.050$ to $B = -.043$).

Using the Baron and Kenny (1986) criteria, the relationship of all three personality variables with emotional exhaustion was found to be mediated by LMX.

To confirm the mediation, a Sobel test was conducted to calculate whether the indirect effect of each of the personality variables on emotional exhaustion via LMX was significantly different from zero. Conscientiousness and work locus of control were found to have significant indirect effects ($p = .083$ and $p = .010$), while neuroticism did not ($p = .130$). Preacher and Hayes (2004: 719) warn that as the Sobel test is based on the assumption of normality of scores of $a \times b$, and the distribution is usually nonnormal and often positively skewed, the Sobel test “will typically yield underpowered tests of mediation” (Preacher & Hayes, 2004: 720). Because of this, confidence intervals were calculated using a bootstrapping approach (Preacher & Hayes, 2004) (see section 3.3.4).

At a 95% level, the confidence intervals were $-.0308$ to $-.0008$, $-.0001$ to $.0214$ and $-.0195$ to $-.0003$ for conscientiousness, neuroticism and work locus of control, respectively. Because zero is not in the confidence intervals for conscientiousness and work locus of control it can be concluded that the indirect effects for these two variables are significantly different from zero at $p < .05$ (two-tailed). As the range for neuroticism includes a zero value, the significance of the indirect path is not confirmed. However, at a confidence level of 90% the confidence interval for neuroticism was $.0008$ to $.0168$. Because zero is not in this confidence interval, it can be concluded that the indirect effect for neuroticism is significantly different from zero at $p < .10$ (two-tailed). Inspection of the P-P plot and the scatterplot of regression standardized residuals for each analysis indicated no violation of assumptions. Inspection of Cook’s distances and values of $DFBETA$ indicated no effect of outliers on the results (maximum values of $.101$ and $-.006$, respectively).

TABLE 7.1 Regression Analyses for Dependent Variable Transformed Emotional Exhaustion (EE[†]) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX

Variable	Model 29 [†]	Model 85 [†]	Model 30 [†]	Model 86 [†]	Model 31 [†]	Model 87 [†]
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	3.712*** (.108)	3.715*** (.107)	3.697*** (.099)	3.702*** (.098)	3.677*** (.108)	3.686*** (.106)
Gender	-.355 (.307)	-.359 (.303)	-.234 (.279)	-.252 (.276)	-.165 (.306)	-.199 (.302)
Tenure	-.186 (.341)	-.217 (.337)	-.182 (.311)	-.214 (.308)	-.041 (.340)	-.097 (.336)
Job Demand	.006 (.007)	.007 (.007)	.007 (.006)	.008 (.006)	.002 (.007)	.004 (.007)
CONSC	-.066** (.019)	-.055** (.019)	- -	- -	- -	- -
NEURO		-	.090*** (.014)	.084*** (.015)	-	-
WLCS		-			-.050*** (.014)	-.043** (.014)
LMX		-.030* (.015)		-.025 [†] (.013)		-.032* (.015)
<i>F</i> value	3.567**	3.760**	10.269***	9.096***	3.786**	4.068**
Sig. <i>F</i> Change	.009	.044	.000	.063	.000	.032
<i>R</i> ²	.108	.138	.258	.280	.114	.148

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 29[†], 30[†] and 31[†], the significance of the *F* change is from model 1[†].

Transformed dependent variable $EE^{\dagger} = \text{SQRT}(EE)$.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

The analysis was repeated for conscientiousness and LMX, using the log terms to investigate whether the results had been affected by nonlinearity. The four Baron and Kenny (1986) criteria were again met: firstly, the relationship between the independent and dependent variable was significant ($B = -5.20$, $p = .001$); secondly, the relationship between the independent variable and the mediator was significant ($B = .698$, $p = .000$); thirdly, the mediator still predicted the dependent variable after controlling for the

independent variable ($B = -.241, p = .015$); and fourthly, the relationship between the independent variable and the dependent variable reduced when the mediator was added to the equation ($B = -5.20, p = .001$ to $B = -4.23, p = .007$). From the Sobel test, the significance (two-tailed) of the indirect effect was calculated to be $p = .091$; from the bootstrap approach, the confidence interval was found to be $-.2469$ and $-.0025$ confirming the significance of the indirect effect. It is concluded that LMX mediates the effects of conscientiousness ($p < .05$), work locus of control ($p < .05$) and neuroticism ($p < .10$) on emotional exhaustion.

Analysis 7.2

The analysis was repeated for neuroticism and work locus of control, using the transformed term for LMX. The results were not materially different from those of analysis 7.1. The Baron and Kenny (1986) criteria were met for the two personality variables. The Sobel test again indicated a significant indirect effect for work locus of control but not neuroticism. The confidence intervals confirmed the significance of the indirect effect for neuroticism ($p < .1$) and work locus of control ($p < .05$). It is concluded that the nonnormality of the variable LMX did not materially influence the results of analysis 7.1.

Analysis 7.3

To investigate the relative importance of each of the independent variables to emotional exhaustion, model 91⁺ was built up in a series of steps starting from model 29⁺, which included only the controls and the CONSC term. The unstandardized coefficients and standard errors are shown in table 7.2 and the standardized coefficients in table 7.3. In model 91⁺, all of the independent variables except conscientiousness were significantly related to emotional exhaustion. The F value for this model was 7.531, $p = .000$ and the R^2 was .375 (adjusted $R^2 = .325$). From table 7.3, the relative importance of each of the variables can be seen. As expected, neuroticism had the largest effect with a standardized coefficient of $\beta = .420, p = .000$. Communication frequency also had a large positive effect with standardized coefficients of $\beta = .250, p = .017$ for the linear term and $\beta = -.156, p = .096$ for the quadratic term. Work locus of control and LMX had negative effects with standardized coefficients of $\beta = -.247, p = .003$ and $\beta = -.182, p = .047$, respectively. However, it should be noted that Jaccard and Turrisi (2003: 68) caution against the use of standardized coefficients when analyzing interaction terms as there is the potential to misinterpret the results. To establish the effect size, and so the relative importance of each variable, the increase in the squared partial correlation R^2 was calculated by regressing the transformed emotional exhaustion measure onto each of the variables separately, while controlling for all of the other variables. The additional variance explained was 19.0% for neuroticism, 7.7% for work

TABLE 7.2 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX and CF

Variable	Model 29 ⁺	Model 85 ⁺	Model 88 ⁺	Model 89 ⁺	Model 90 ⁺	Model 91 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	3.712*** (.108)	3.715*** (.107)	3.699*** (.104)	3.699*** (.104)	3.843*** (.126)	3.806*** (.115)
Gender	-.355 (.307)	-.359 (.303)	-.274 (.296)	-.276 (.296)	-.302 (.293)	-.233 (.265)
Tenure	-.186 (.341)	-.217 (.337)	-.152 (.329)	-.147 (.328)	-.163 (.325)	-.180 (.293)
Job Demand	.006 (.007)	.007 (.007)	.003 (.007)	.003 (.007)	.003 (.007)	.003 (.006)
CONSC	-.066** (.019)	-.056** (.019)	-.048* (.019)	-.044* (.019)	-.044* (.019)	-.013 (.018)
NEURO	- -	- -	- -	- -	- -	.074*** (.015)
WLCS		- -	-.039** (.014)	-.041** (.014)	-.038** (.014)	-.038** (.013)
LMX		-.030* (.015)	-.023 (.015)	-.031 [†] (.016)	-.037* (.017)	-.030* (.015)
CF				.033 (.033)	.071* (.035)	.078* (.032)
CF ²					-.011 [†] (.006)	-.009 [†] (.005)
<i>F</i> value	3.567***	3.760***	4.6201***	4.150***	4.167***	7.531***
Sig. <i>F</i> Change	.009	.044	.006	.271	.053	.000
<i>R</i> ²	.108	.138	.193	.202	.228	.375

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 29⁺, the significance of the change is from model 1⁺.

Transformed dependent variable EE⁺ = SQRT (EE).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

locus of control, 5.2% for communication frequency, and 3.4% for LMX. The relative importance of personality over the quality of LMX is clearly evident.

TABLE 7.3 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX and CF

Variable	Model 29 ⁺	Model 85 ⁺	Model 88 ⁺	Model 89 ⁺	Model 90 ⁺	Model 91 ⁺
	β	β	β	β	β	β
Gender	-.102	-.103	-.078	-.079	-.086	-.067
Tenure	-.048	-.056	-.039	-.038	-.042	-.046
Job Demand	.074	.095	.038	.039	.033	.041
CONSC	-.309**	-2.58**	-.225*	-.205*	-.203*	-.061
NEURO	-	-	-	-	-	.420***
WLCS		-	-.250**	-.266**	-.248**	-.247**
LMX		-.183*	-.136	-.185 [†]	-.222*	-.182*
CF				.106	.230*	.250*
CF ²					-.199 [†]	-.156 [†]
<i>F</i> value	3.567***	3.760***	4.6201***	4.150***	4.167***	7.531***
Sig. <i>F</i> Change	.009	.044	.006	.271	.053	.000
<i>R</i> ²	.108	.138	.193	.202	.228	.375

Notes: *n* = 128; Standardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 29⁺, the significance of the change is from model 1⁺.

Transformed dependent variable EE⁺ = SQRT (EE).

[†] *p* < .1; * *p* < .05; ** *p* < .01; and *** *p* < .001.

Analysis 7.4

To confirm the moderation by LMX of the curvilinear relationship between communication frequency and emotional exhaustion while controlling for the personality variables, the interaction term LMX x CF² was added to an appropriate prior model. The results are shown in table 7.4. Cohen et al. (2003: 211) suggest that to decide whether to include higher-order terms in an equation, one of three criteria may be employed. The first criteria, that of the significance of the *F* change, was met for all four cases of conscientiousness, neuroticism, work locus of control and all three variables partialled out with *p* = .044, *p* = .062, *p* = .016 and *p* = .091, respectively. The second criteria, the change in *R*², was also met in all four cases. The values of the changes in *R*²

were .035, .031, .051 and .024, respectively. This is above the lower limit of .02, and indicates a small effect size. The third criteria, the change in adjusted R^2 , was only met for the cases where conscientiousness and work locus of control were partialled out (change in adjusted $R^2 = .024$ and .036, respectively). Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions (see figures A-7.1 and A-7.2, respectively, in appendix 7.1). Inspection of the Variance Inflation Factors (VIF), Cook's distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results (maximum values of 3.44, .047 and -.007, respectively).

TABLE 7.4 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE^+) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX and CF

Variable	Model 92 ⁺	Model 93 ⁺	Model 94 ⁺	Model 95 ⁺
	β	β	β	β
Gender	-.127	-.098	-.088	-.076
Tenure	-.020	-.028	.011	-.018
Job Demand	.119	.129	.084	.069
CONSC	-.199*	-	-	-.029
NEURO	-	.426***	-	.406***
WLCS	-	-	-.273**	-.249**
LMX	-.100	-.101	-.086	-.059
CF	.299*	.319**	.375**	.324**
CF ²	-.171	-.154	-.166	-.146
LMX x CF	.097	.105	.159	.121
LMX x CF ²	-.316*	-.264 [†]	-.362*	-.234 [†]
<i>F</i> value	3.246**	6.411***	3.890***	6.546***
Sig. <i>F</i> Change	.044	.062	.016	.091
Change in R^2	.035	.031	.051	.024

Notes: $n = 128$; Standardized coefficients are reported for the respective regression steps. The significance of the F change, and the change in the squared partial correlation R^2 is for the effect of adding the term LMX x CF² to the respective prior model.

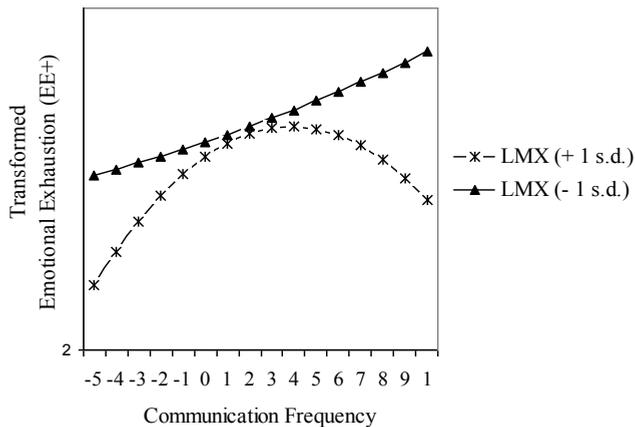
Transformed dependent variable $EE^+ = \text{SQRT}(EE)$.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

The analysis was repeated using the log terms for CONSC and LMX. There was no change to any of the significance of the relationships. In model 92⁺⁺, the significance of the coefficient for the product term between LMX and the quadratic communication frequency term declined slightly from $p = .044$, for the $LMX^+ \times CF^2$ term, to $p = .045$, for the $LOG(LMX) \times CF^2$ term. In model 95⁺⁺, the significance of the coefficient for the product term between LMX and the quadratic communication frequency term improved slightly from $p = .091$, for the $LMX \times CF^2$ term to $p = .089$, for the $LOG(LMX) \times CF^2$ term. The change in the squared partial correlation R^2 increased from .024 to .026, again indicating a small effect size. It is concluded that the nonlinearity of the conscientiousness and LMX terms did not materially affect the results.

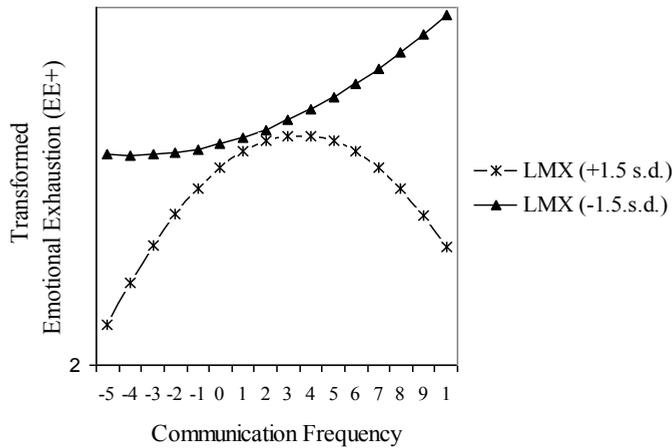
The plot for the curvilinear communication frequency relationship, linear LMX relationship and curvilinear communication frequency by linear LMX interaction (when controlling for all of the personality variables, job demand, gender and tenure) were completed, and are shown in figure 7.1.

FIGURE 7.1 Interaction between Communication Frequency and LMX predicting Transformed Emotional Exhaustion (EE⁺) whilst controlling for Gender, Tenure, Job Demand, Conscientiousness, Neuroticism and Work Locus of Control



As can be seen from figure 7.1, the curves for LMX_H and LMX_M still show the same effect as previously, except that the upward curve for LMX_M is slightly less pronounced. As it is expected that the effect will only be present for quite high and low values of LMX, the curves for ± 1.5 standard deviations were also plotted, and are shown in figure 7.2. The difference in the two curves is again clearly evident. It is concluded that while the effect of controlling for the personality variables, and particularly that of neuroticism, reduced the effect in magnitude, the conclusions reached previously are still valid.

FIGURE 7.2 Interaction between Communication Frequency and LMX predicting Transformed Emotional Exhaustion (EE⁺) whilst controlling for Gender, Tenure, Job Demand, Conscientiousness, Neuroticism and Work Locus of Control



Analysis 7.5

The analysis was repeated for the untransformed variable emotional exhaustion. The results are shown in table 7.5. As can be seen by comparing them to the results in table 7.4, there was no material change. One slight difference was that in model 95 the LMX x CF term became significant ($p = .079$, compared to $p = .250$, previously). The R^2 and F values in the two analyses were very similar ($R^2 = .393$ and $R^2 = .393$, and $F = 6.546$ and $F = 6.544$, for models 95⁺ and 94, respectively). Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions (see figures A-7.3 and A-7.4, respectively, in appendix 7.1). Inspection of Variance Inflation Factors (VIF), Cook's distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results (largest values of 3.444, .0888 and -.115, respectively).

7.3.3 Summary of Results for Dependent Variable Emotional Exhaustion

LMX was found to mediate the relationships of conscientiousness, neuroticism and work locus of control with emotional exhaustion. When emotional exhaustion was regressed onto all three of the personality trait variables, LMX and communication frequency, while controlling for gender, tenure, job demand, neuroticism, work locus of control, LMX and communication frequency, all of the variables considered, except conscientiousness, significantly predicted emotional exhaustion. The effect size was found to be large for neuroticism, moderate for work locus of control, and small for both communication frequency and LMX (increases in the squared partial correlations R^2 of .190, .077, .052 and .034, respectively). The effect sizes for the three personality factors

together was large, while the effect size for LMX and communication frequency together, was smaller (increases in the squared partial correlations R^2 of .287 and .060, respectively). The linear LMX and curvilinear communication frequency interaction in the prediction of burnout was still found to be significant when the three personality traits were controlled for.

TABLE 7.5 Regression Analysis for Dependent Variable Emotional Exhaustion (EE) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX and CF

Variable	Model 91	Model 95
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Gender	-.054	-.059
Tenure	-.032	-.004
Job Demand	.075	.109
CONSC	-.050	-.011
NEURO	.419***	.406***
WLCS	-.247**	-.254**
LMX	-.179 [†]	-.037
CF	.260*	.343**
CF ²	-.134	-.162
LMX x CF		.185 [†]
LMX x CF ²		-.234 [†]
<i>F</i> value	7.847***	6.544***
Sig. <i>F</i> Change	.000	.092
<i>R</i> ²	.367	.393

Notes: $n = 128$; Standardized coefficients are reported for the respective regression steps.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

7.3.4 Analysis for Dependent Variable Depersonalization

As a successful transformation to normalize depersonalization was not found (see section 3.3.7), to minimize lack of normality and heteroscedasticity in the regression residuals, analysis 7.6 was conducted as previously, with transformations of the nonnormal variables JD, CONSC, LMX and CF in combination with the technique of constructing a variable and including it in the regression equation, to provide an

estimate for a value of λ , for use in a Box-Cox transformation of $DEP^{(\lambda)}$. The optimum transformations were found to be $DEP^{(\lambda)} = (DEP^\lambda - 1) / \lambda$, where $\lambda = .52$ for the analysis of conscientiousness and LMX, and $\lambda = .59$ for the analyses of work locus of control and LMX. To assess the relative importance of each of the independent variables to depersonalization, analysis 7.7 was conducted using hierarchical linear regression modelling. Subsequently, in analysis 7.8, a logistic regression analysis was conducted using categorized depersonalization scores. In analysis 7.7, the optimum value of λ for the transformation of depersonalization was $\lambda = .55$ for the analysis involving all the variables. For all of the analyses, the previously identified outlier was removed.

Analysis 7.6

The results are shown in table 7.6. For conscientiousness, the four Baron and Kenny (1986) criteria were met: firstly, the relationship between $CONSC^+$ and $DEP^{(\lambda)}$ was significant ($B = .488, p = .006$); secondly, the relationship between $CONSC^+$ and LMX^+ was significant ($B = .256, p = .075$); thirdly, LMX^+ still predicted $DEP^{(\lambda)}$ after controlling for $CONSC^+$ ($B = .387, p = .010$); and fourthly, the relationship between the $CONSC^+$ and $DEP^{(\lambda)}$ reduced when LMX^+ was added to the equation ($B = .488, p = .006$ to $B = .389, p = .027$). The Sobel test calculated the significance (two-tailed) of the indirect effect as $p = .075$. The confidence interval was calculated as .0140 to .2873, confirming the indirect effect ($p < .05$). The analysis was repeated for the log terms for conscientiousness and LMX. The four Baron and Kenny (1986) conditions were again met, and the significance from the Sobel test was $p = .040$. It is concluded that the results were not adversely influenced by the nonlinearity of the variables of $CONSC$ and LMX . The results confirm that the relationship between conscientiousness and depersonalization is mediated by LMX .

The relationship between work locus of control and depersonalization was also found to be mediated by LMX . The four Baron and Kenny (1986) criteria were again met: firstly, the relationship between $WLCS$ and $DEP^{(\lambda)}$ was significant ($B = -.068, p = .004$); secondly, the relationship between $WLCS$ and LMX^+ was significant ($B = -.039, p = .007$); thirdly, LMX^+ still predicted $DEP^{(\lambda)}$ after controlling for $WLCS$ ($B = .373, p = .013$); and fourthly, the relationship between the $WLCS^+$ and $DEP^{(\lambda)}$ reduced when LMX^+ was added to the equation ($B = -.068, p = .004$ to $B = -.054, p = .022$). From the Sobel test (two-tailed), the significance of the indirect effect was calculated to be $p = .061$. Using the bootstrap approach, the confidence interval was calculated as $-.0359$ to $-.0008$, confirming the significance of the indirect effect ($p < .05$). The mediation of the relationship between neuroticism and depersonalization by LMX was not tested as there was only limited support previously that neuroticism was significantly related to depersonalization. Inspection of the P-P plot and the scatterplot of regression standardized residuals for the analyses indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of $DFBETA$ indicated

no issues with multicollinearity or effect of outliers on the results (maximum values 1.067, .128 and 1.060, respectively).

TABLE 7.6 Regression Analysis for Dependent Variable Transformed Depersonalization (DEP⁺) and Independent Variables Gender, Tenure and Transformed Mean-Centered JD, CONSC and LMX and Mean-Centered WLCS

Variable	Model 96 ⁺⁺	Model 97 ⁺⁺	Model 98 ⁺⁺	Model 99 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	-.123 (.179)	-.119 (.175)	-.028 (.176)	-.014 (.172)
Gender	-.300 (.507)	-.300 (.495)	-.092 (.499)	-.143 (.488)
Tenure	.011 (.590)	-.029 (.576)	.293 (.582)	.203 (.571)
Job Demand ⁺	.419 (3.042)	1.345 (2.990)	-1.288 (3.050)	-.045 (3.021)
CONSC ⁺	.488** (.173)	.389* (.173)	- -	- -
WLCS			-.068** (.023)	-.054* (.023)
LMX ⁺		.387* (.148)		.373* (.147)
<i>F</i> value	2.027 [†]	3.068*	2.280 [†]	3.193*
Sig. <i>F</i> Change	.006	.010	.004	.013
<i>R</i> ²	.065	.117	.072	.121

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 96⁺⁺ and 98⁺⁺, the significance of the *F* change is from model 1⁺⁺.

For models 96⁺⁺ and 97⁺⁺, transformed dependent variable $DEP^{(\lambda)} = (DEP^\lambda - 1) / \lambda$, where $\lambda = .52$.

For models 98⁺⁺ and 99⁺⁺, transformed dependent variable $DEP^{(\lambda)} = (DEP^\lambda - 1) / \lambda$, where $\lambda = .59$.

Transformed dependent variables $JD^+ = LOG(JD)$, $CONSC^+ = SQRT(k - CONSC)$ and $LMX^+ = SQRT(k - LMX)$.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 7.7

To investigate the relative importance of each of the independent variables to depersonalization, the variables were added in a series of steps, starting from a model which included only the controls variables and the conscientiousness term. The unstandardized coefficients and standard errors are shown in table 7.7, and the standardized coefficients in table 7.8.

In model 104⁺⁺, conscientiousness and neuroticism were not significantly related to depersonalization. Work locus of control and LMX were negatively related to depersonalization with unstandardized coefficients of $B = -.054$, $p = .022$ and $B = .461$, $p = .006$, respectively, (the positive coefficient is due to the reflect element of the transformation of the LMX term). Communication frequency was positively related to depersonalization with an unstandardized coefficient $B = .2.188$, $p = .058$. The F value for this model was 3.001, $p = .004$, and the R^2 was .175 (adjusted $R^2 = .117$). From table 7.8, the relative importance of each of the variables can be seen. Unexpectedly, LMX had the largest effect with a standardized coefficient $\beta = .283$, $p = .006$. Work locus of control also had a large negative effect with $\beta = -.214$, $p = .022$. The individual effect size of LMX was confirmed as greater than that of work locus of control (increase in the squared partial correlations R^2 of .064 and .045, respectively). Communication frequency had a positive effect with a standardized coefficient of $\beta = .189$, $p = .058$. Neuroticism was not significantly related in any of the models. Conscientiousness was significant until the effect of communication frequency was partialled out in model 103⁺⁺. Another effect of controlling for communication frequency was that the strength of the LMX relationship increased ($B = .322$, $p = .035$ to $B = .461$, $p = .006$).

Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions (see figures A-7.5 and A-7.6, respectively, in appendix 7). Inspection of Variance Inflation Factors (VIF), Cook's distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results (maximum values of 1.416, .102 and -.702).

TABLE 7.7 Regression Analysis for Dependent Variable Transformed Depersonalization (DEP⁺) and Independent Variables Gender, Tenure and Transformed Mean-Centered JD, CONSC, LMX and CF and Mean-Centered WLCS

Variable	Model 100 ⁺⁺	Model 101 ⁺⁺	Model 102 ⁺⁺	Model 103 ⁺⁺	Model 104 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)
Constant	-.084 (.182)	-.061 (.178)	-.083 (.174)	-.074 (.172)	-.074 (.170)
Gender	-.187 (.515)	-.309 (.506)	-.184 (.497)	-.214 (.490)	-.214 (.484)
Tenure	.143 (.601)	.038 (.589)	.193 (.579)	.118 (.571)	.101 (.565)
Job Demand ⁺	.660 (3.106)	.443 (3.040)	-1.025 (3.025)	-.047 (3.014)	-.275 (2.982)
CONSC ⁺	- -	.463* (.185)	.386* (.183)	.339 [†] (.182)	.265 (.184)
NEURO	.033 (.028)	.007 (.029)	.006 (.029)	-.003 (.028)	.001 (.028)
WLCS			-.059* (.023)	-.048* (.023)	-.054* (.023)
LMX ⁺				.322* (.151)	.461** (.166)
CF ⁺					2.188 [†] (1.142)
<i>F</i> value	.402	1.588	2.476*	2.839**	3.001**
Sig. <i>F</i> Change	.238	.014	.012	.035	.058
<i>R</i> ²	.014	.064	.114	.148	.175

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the F value, the significance refers to the change in the F value between models.

Transformed dependent variable $DEP^{(\lambda)} = (DEP^\lambda - 1) / \lambda$, where $\lambda = .55$.

Transformed dependent variables $JD^+ = \text{LOG}(JD)$, $CONSC^+ = \text{SQRT}(k - \text{CONSC})$, $LMX^+ = \text{SQRT}(k - \text{LMX})$ and $CF^+ = \text{LOG}(CF)$.

For model 100⁺⁺, the significance of the change is from model 1⁺⁺.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 7.8 Regression Analysis for Dependent Variable Transformed Depersonalization (DEP⁺) and Independent Variables Gender, Tenure and Transformed Mean-Centered JD, CONSC, LMX and CF and Mean-Centered WLCS

Variable	Model 100 ⁺⁺	Model 101 ⁺⁺	Model 102 ⁺⁺	Model 103 ⁺⁺	Model 104 ⁺⁺
	β	β	β	β	β
Gender	-.033	-.055	-.033	-.038	-.038
Tenure	.022	.006	.030	.018	.016
Job Demand ⁺	.020	.013	-.030	-.001	-.008
CONSC ⁺	-	.242*	.202*	.177 [†]	.138
NEURO	.109	.022	.021	-.010	.005
WLCS			-.234*	-.191*	-.214*
LMX ⁺				.197*	.283**
CF ⁺					.189 [†]
<i>F</i> value	.402	1.588	2.476*	2.839**	3.001**
Sig. <i>F</i> Change	.238	.014	.012	.035	.058
<i>R</i> ²	.014	.064	.114	.148	.175

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable $DEP^{(\lambda)} = (DEP^\lambda - 1) / \lambda$, where $\lambda = .55$.

Transformed dependent variables $JD^+ = \text{LOG}(JD)$, $CONSC^+ = \text{SQRT}(k - \text{CONSC})$, $LMX^+ = \text{SQRT}(k - \text{LMX})$ and $CF^+ = \text{LOG}(CF)$.

For model 100⁺⁺, the significance of the change is from model 1⁺⁺.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 7.8

To investigate the relative importance of each of the independent variables to depersonalization, a logistic regression analysis for depersonalization coded into two categories was also conducted. Scores were coded into no depersonalization reported (41.4%), and some level of depersonalization reported (55.5%). As logistic regression makes no assumptions about linear relationships amongst the predictors (Tabachnick & Fidell, 2007: 443), the analysis was conducted for the variables CONSC and LMX. All of the variables were entered in a single step to give model 105. The results are shown in table 7.9. The Omnibus test for the model indicted significance ($p = .025$). The Cox &

Snell R square and Nagelkerke R square were .134 and .180, respectively, suggesting that between 13.4% and 18.0% of the variability is explained by the terms in the model.

From the Wald Test, conscientiousness, work locus of control and LMX were found to contribute significantly to the predictive ability of the model with coefficients of $B = -.091, p = .061, B = -.065, p = .036$ and $B = -.061, p = .098$, respectively. All three variables have a negative coefficient, which suggests that the higher the value of the variable, the less likely it is the individual will report experiencing depersonalization. From the value of the coefficients, it is concluded that individuals high in conscientiousness will be less likely to experience depersonalization. Work locus of control and LMX have an equal value in reducing the likelihood of depersonalization.

TABLE 7.9 Logistic Regression Analysis for Dependent Variable Depersonalization and Independent Variables Gender, Tenure, JD, CONSC, NEURO, WLCS, LMX and CF

Variable	Model 105					
	<i>B</i>	<i>s.e.</i>	Exp(B)	95% C.I. for Exp (B)		
				<i>Lower</i>	<i>Upper</i>	
Gender	.277	.674	1.319	.352	4.945	
Tenure	-.362	.734	.696	.165	2.936	
Job Demand	-.002	.015	.998	.969	1.028	
CONSC	-.091 [†]	.049	.913	.830	1.004	
NEURO	.004	.036	1.004	.935	1.078	
WLCS	-.065*	.031	.937	.881	.996	
LMX	-.061 [†]	.037	.941	.876	1.011	
CF	.039	.064	1.040	.917	1.178	
Constant	9.022*	3.574	8282.2	-	-	
Omnibus test of Model Sig.	.025					
Hosmer-Lemeshow Test (Sig.)	.671					
Cox & Snell R^2	.134					
Nagelkerke R^2	.180					

Notes: A value of $p > 0.05$ for the Hosmer-Lemeshow Test indicates support for the model.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Neuroticism and communication frequency did not contribute significantly to the model ($p = .907$ and $p = .544$, respectively). Tabachnick and Fidell (2007: 548) report that the odds ratio (given by Exp (B) in table 7.8) is “the increase (or decrease if the ratio is less than one) in odds of being in one outcome category when the value of the predictor increases by one unit.” For conscientiousness, the odds ratio was found to be .913 with a 95% confidence interval of .830 to 1.028. This indicates that the higher the value of conscientiousness, the less likely the individual is to report suffering from depersonalization. For every one unit increase in CONSC, the odds of the individual reporting suffering from depersonalization decreases by a factor of .913, all other factors being equal. For work locus of control and LMX, the odds ratios were found to be .937 and .941 with 95% confidence intervals of .881 to .996 and .876 to 1.011, respectively.

Cohen et al. (2003: 514) suggest that inspection of *DFBETA* values is particularly useful in logistic regression for identifying outlying cases that may have undue impact on the regression coefficients of the variables. The maximum value found was .025, which suggests no case had an undue effect on the results of this analysis.

7.3.5 Summary of Results for Dependent Variable Depersonalization

In the linear regression analysis, LMX, communication frequency, conscientiousness and work locus of control were all found to significantly predict depersonalization. This was confirmed in the logistic regression except for the case of communication frequency. LMX was found to have the largest effect of the variables. The additional variance explained by LMX was .064, compared to .045 for work locus of control. LMX was found to mediate the relationships between both conscientiousness and work locus of control with depersonalization.

7.3.6 Analysis for Dependent Variable reduced Personal Accomplishment

As previously, to minimize skewness in the residuals the initial analysis was conducted for the transformed variable $rPA^+ = rPA^\lambda$ (where $\lambda = 0.7$). In analysis 7.9, whether LMX mediated the relationships between each of the personality variables and reduced personal accomplishment was investigated. In analysis 7.10, effect of the nonnormality of the independent variables JD, CONSC, LMX and CF on the results was checked. In analysis 7.11, the relative importance of each of the independent variables to reduced personal accomplishment was assessed.

Analysis 7.9

The results are shown in table 7.10. For the case of conscientiousness, three of the four criteria of Baron and Kenny (1986) were met. The third criteria was not met as LMX did not predict rPA^+ after CONSC was controlled for ($B = -.062$, $p = .120$).

TABLE 7.10 Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA^+) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX

Variable	Model 46 ⁺	Model 106 ⁺	Model 47 ⁺	Model 107 ⁺	Model 48 ⁺	Model 108 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	5.824*** (.285)	5.831*** (.283)	5.795*** (.285)	5.808*** (.283)	5.748*** (.274)	5.762*** (.273)
Gender	.504 (.808)	.496 (.803)	.706 (.808)	.657 (.801)	.931 (.778)	.875 (.776)
Tenure	.163 (.898)	.099 (.893)	.234 (.900)	.148 (.894)	.476 (.864)	.384 (.863)
Job Demand	.017 (.018)	.021 (.018)	.020 (.018)	.023 (.018)	.005 (.017)	.009 (.018)
CONSC	-.119* (.049)	-.096 [†] (.019)	- -	- -	- -	- -
NEURO		- -	.091* (.042)	.075 [†] (.015)	- -	- -
WLCS		- -			-.137*** (.035)	-.125** (.036)
LMX		-.062 (.039)		-.067 [†] (.039)		-.052 (.038)
<i>F</i> value	1.973	2.088 [†]	1.725	1.999 [†]	4.389**	3.923**
Sig. <i>F</i> Change	.018	.120	.030	.087	.000	.168
<i>R</i> ²	.063	.082	.055	.079	.130	.144

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 46⁺, 47⁺ and 48⁺, the significance of the *F* change is from model 15⁺.

Transformed dependent variable $rPA^+ = rPA^\lambda$, (where, $\lambda = 0.7$).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

A Sobel test was conducted, which also indicated that the indirect effect was nonsignificant ($p = .156$). Preacher and Hayes (2004: 719) warn that “the method described by Baron and Kenny (1986) suffers from low statistical power in most situations.” They also warn that due to the significance of the Sobel test being based on the assumption that the distribution of the scores of $a \times b$ is normal under the null hypothesis, and because this distribution is usually nonnormal and often positively

skewed, the Sobel test “will typically yield underpowered tests of mediation” (Preacher & Hayes, 2004: 720). Because of this, the confidence intervals were calculated using the bootstrapping approach (Preacher & Hayes, 2004). This was found to be -.0681 to .0050 for a 95% (two-tailed) confidence level, again indicating that LMX does not mediate conscientiousness. However, at a 90% confidence level, the interval was -.0605 to -.0007. Because zero is not in the confidence interval, it can be concluded that the indirect effect is significantly different from zero at $p < .1$ (two-tailed).

For neuroticism, the four Baron and Kenny (1986) criteria were met: firstly, the relationship between NEURO and rPA^+ was significant ($B = .091, p = .030$); secondly, the relationship between NEURO and LMX was significant ($B = -.241, p = .015$); thirdly, LMX still predicted rPA^+ after controlling for NEURO ($B = -.067, p = .087$); and fourthly, the relationship between NEURO and the rPA^+ reduced when the mediator was added to the equation ($B = .091, p = .030$ to $B = .075, p = .079$). The Sobel test indicated a nonsignificant ($p = .159$) indirect effect. From the bootstrapping approach, the 90% confidence interval was calculated to be .0014 to .0450. Because zero is not in the confidence interval, it can be concluded that the indirect effect is indeed significantly different from zero at $p < .10$. As the Baron and Kenny (1986) criteria were met and the bootstrapping approach indicates a significant indirect effect, it is concluded that LMX mediates the effect of neuroticism on reduced personal accomplishment.

Similar to the case of conscientiousness, for work locus of control the third condition of the Baron and Kenny (1986) criteria was not found to be met, with the relationship between LMX and rPA^+ nonsignificant ($B = -.052, p = .168$) when WLCS was controlled for. Again, the Sobel test resulted in a nonsignificant result ($p = .227$). The confidence intervals of the significance of the indirect effect were calculated as -.362 to .0007. Because zero is in the confidence interval, it is concluded that the indirect effect is not significantly different from zero at $p < .1$ (two-tailed).

Inspection of the P-P plots and the scatterplots of regression standardized residuals for these analyses indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook’s distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results (the largest values in these analyses were 1.117, .165 and -.0159, respectively).

Analysis 7.10

The analysis was repeated using transformed terms for the variables that were nonnormal in their distribution (job demand, CONSC and LMX). The results are shown in table 7.11. The results were materially different with the LMX^+ term now significant when all three personality variables were controlled for.

TABLE 7.11 Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA⁺) and Independent Variables Gender, Tenure and Mean-Centered NEURO and WLCS and Mean-Centered Transformed JD, CONSC and LMX

Variable	Model 46 ⁺⁺	Model 106 ⁺⁺	Model 47 ⁺⁺	Model 107 ⁺⁺	Model 48 ⁺⁺	Model 108 ⁺⁺
	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	<i>B</i> (<i>s.e.</i>)
Constant	3.920*** (.798)	4.270*** (.807)	5.795*** (.285)	5.807*** (.282)	5.748*** (.274)	5.763*** (.272)
Gender	.509 (.806)	.509 (.795)	.702 (.808)	.667 (.797)	.930 (.778)	.877 (.773)
Tenure	.139 (.896)	.072 (.886)	.239 (.900)	.152 (.888)	.477 (.864)	.379 (.859)
Job Demand ⁺	5.204 (4.475)	6.296 (4.717)	5.483 (4.773)	6.564 (4.736)	1.422 (4.700)	2.713 (4.729)
CONSC ⁺	.687* (.274)	-.563* (.277)	- -	- -	- -	- -
NEURO		-	.091* (.042)	.072 [†] (.015)	-	-
WLCS		-			-.137*** (.035)	-.122** (.036)
LMX ⁺		.479* (.238)		.496* (.239)		.387 [†] (.233)
<i>F</i> value	2.114 [†]	2.543*	1.735	2.288 [†]	4.339**	4.118**
Sig. <i>F</i> Change	.013	.047	.056	.089	.000	.099
<i>R</i> ²	.067	.098	.055	.079	.130	.150

Notes: *n* = 128; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 46⁺⁺, 47⁺⁺ and 48⁺⁺, the significance of the *F* change is from model 15⁺.

Transformed dependent variable rPA⁺ = rPA^λ, (where, λ = 0.7).

[†] *p* < .1; * *p* < .05; ** *p* < .01; and *** *p* < .001.

For the case of conscientiousness, the third criteria for mediation was now also met with LMX⁺ predicting rPA⁺ after controlling for CONSC⁺ (*B* = .479, *p* = .047). The confidence interval (.0158 to .3426) (*p* < .10) confirmed the significance of the indirect effect. The previous tentative conclusion that LMX does mediate the effect of

conscientiousness on reduced personal accomplishment, has been confirmed. For neuroticism, there was no change to the previous result with the four criteria again met and the confidence interval ($p < .10$) of .0030 to .0543, confirming the significance of the indirect effect. In the case of work locus of control, the four criteria were now met. LMX⁺ predicted rPA⁺ after controlling for WLCS ($B = .387, p = .099$). Also, the confidence interval ($p < .10$) of -.0415 to -.0005 suggested a significant indirect effect. It is tentatively concluded that LMX mediates the work locus of control effect on reduced personal accomplishment. Inspection of the P-P plots and the scatterplots of regression standardized residuals for these analyses indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results (the largest values in these analyses were 1.132, .141 and -.105, respectively).

Analysis 7.11

To investigate the relative importance of each of the independent variables to reduced personal accomplishment, the LMX and CF terms were added to model 50⁺ to give model 109⁺. The results are shown in table 7.12. The only variable found to have a significant relationship with reduced personal accomplishment was work locus of control, with a standardized coefficient $\beta = -.327, p = .001$. This demonstrates the importance of work locus of control in minimizing levels of reduced personal accomplishment. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results (largest values of 1.424, .092 and .029, respectively).

The analysis was repeated using transformed terms for the nonnormal variables, and log terms for conscientiousness and LMX. There were no material changes to the results. The value of the standardized coefficient for the WLCS term was $\beta = -.315, p = .002$, for the transformed variable analysis and $\beta = -.333, p = .001$, for the log term analysis.

TABLE 7.12 Regression Analysis for Dependent Variable Transformed reduced Personal Accomplishment (rPA⁺) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX and CF

Variable	Model 50 ⁺	Model 109 ⁺	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	β
Constant	5.774*** (.271)	5.779*** (.273)	
Gender	.821 (.773)	.801 (.778)	.089
Tenure	.323 (.856)	.288 (.862)	.029
Job Demand	.005 (.017)	.008 (.018)	.038
CONSC	-.064 (.051)	-.050 (.054)	-.091
NEURO	.056 (.042)	.053 (.043)	.115
WLCS	-.122** (.035)	-.120** (.037)	-.302**
LMX		-.040 (.043)	-.094
CF		.035 (.078)	.043
<i>F</i> value	3.838**	2.958**	
Sig. <i>F</i> Change	.000	.650	
<i>R</i> ²	.166	.172	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 50⁺, the significance of the *F* change is from model 15⁺.

Transformed dependent variable $rPA^+ = rPA^\lambda$, (where, $\lambda = 0.7$).

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

7.3.7 Summary of Results for Dependent Variable reduced Personal Accomplishment

The results of this section suggest that work locus of control is the most important of the variables considered for the prediction of reduced personal accomplishment. When reduced personal accomplishment was regressed onto all five variables under study, only work locus of control was found to significantly predict the dependent variable. The effect size for work locus of control was moderate, explaining an additional 7.7% of variance.

LMX was found to mediate neuroticism in its relationship with reduced personal accomplishment, and there was partial support to indicate that LMX also mediated the relationships between both conscientiousness and work locus of control with reduced personal accomplishment.

7.3.8 Analysis for Dependent Variable Burnout

The unidimensional measure of burnout (MBI) was found to be normal in distribution. In analysis 7.12, whether LMX mediated the relationships between each of the personality variables and burnout was investigated. In analysis 7.13, the effect of the nonnormality of the variables JD, CONSC and LMX on the results of the mediation analysis was checked. In analysis 7.14, the relative importance of each of the independent variables to burnout was examined.

Analysis 7.12

To test whether LMX acted as a mediator for conscientiousness, neuroticism and work locus of control, the LMX term was added to each of the models 51, 52 and 53 to give models 110, 111 and 112, respectively. The results are shown in table 7.13. According to Baron and Kenny (1986) a variable is a mediator if:

1. there is a significant relationship between the independent variable and the dependent variable. As previously, conscientiousness, neuroticism and work locus of control were found to be significantly related to emotional exhaustion ($B = -.950, p = .000$, $B = 1.024, p = .000$, and $B = -.873, p = .000$, respectively).
2. there is a significant relationship between the independent variable and the mediator. Conscientiousness, neuroticism and work locus of control were found to be significantly related to LMX ($B = .359, p = .002$, $B = -.241, p = .015$, and $B = .219, p = .011$, respectively) (see chapter 6).
3. the mediator still predicts the dependent variable after controlling for the independent variable. As can be seen in table 7.13, LMX still predicted emotional exhaustion after each of conscientiousness, neuroticism and work locus of control were controlled for ($B = -.479, p = .011$, $B = -.461, p = .009$, and $B = -.459, p = .010$, respectively).

TABLE 7.13 Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX

Variable	Model 51	Model 110	Model 52	Model 111	Model 53	Model 112
	<i>B</i> (<i>s.e.</i>)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)
Constant	29.894*** (1.360)	29.945*** (1.328)	29.675*** (1.297)	29.766*** (1.266)	29.349*** (1.306)	29.477*** (1.276)
Gender	-1.028 (3.859)	-1.088 (3.769)	.657 (3.670)	.321 (3.583)	1.986 (3.705)	1.496 (3.621)
Tenure	.964 (4.287)	.470 (4.192)	1.263 (4.088)	.674 (3.994)	3.216 (4.114)	2.410 (4.027)
Job Demand	.136 (.084)	.162 [†] (.083)	.157 [†] (.080)	.178* (.079)	.063 (.083)	.095 (.082)
CONSC	-.950*** (.236)	-.778** (.240)	- -	- -	- -	- -
NEURO		-	1.024*** (.111)	.913*** (.190)	-	-
WLCS		-			-.873*** (.167)	-.772*** (.167)
LMX		-.479* (.185)		-.461** (.174)		-.459* (.176)
<i>F</i> value	4.999**	5.527***	8.310***	8.384***	7.854***	7.961***
Sig. <i>F</i> Change	.000	.011	.000	.009	.000	.010
<i>R</i> ²	.145	.191	.220	.264	.210	.254

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 51, 52 and 53, the significance of the *F* change is from model 1.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

- the relationship between the independent variable and the dependent variable is reduced when the mediator is in the equation. When the LMX term was added to the respective models, the unstandardized coefficients of all three terms reduced (CONSC from $B = -.950$ to $B = -.778$, NEURO from $B = 1.024$ to $B = .913$ and WLCS from $B = -.873$ to $B = -.772$).

Using the Baron and Kenny (1986) criteria, the relationship of all three personality variables with burnout was found to be mediated by LMX. To confirm the mediation, a

Sobel test was conducted to calculate whether the indirect effect of each of the personality variables on burnout via LMX was significantly different from zero. Conscientiousness, neuroticism and work locus of control were all found to have significant indirect effects ($p = .019$, $p = .044$ and $p = 0.032$). The analysis was repeated using log terms for conscientiousness and LMX, to investigate whether the results had been affected by nonlinearity. The four Baron and Kenny (1986) criteria were again met and the Sobel test confirmed the significance of the indirect path ($p = .012$). It is concluded that LMX mediates the effects of conscientiousness, work locus of control and neuroticism on burnout.

Analysis 7.13

The analysis was repeated for neuroticism and work locus of control, using the transformed term for LMX. The results were not materially different from those of analysis 7.12. The Baron and Kenny (1986) criteria were met for the two personality variables. The Sobel test again indicated a significant indirect effect for both work locus of control and neuroticism ($p = .044$ and $p = .031$, respectively). It is concluded that the nonnormality of the variable LMX did not materially influence the results of analysis 7.12.

Analysis 7.14

To investigate the relative importance of each of the independent variables to burnout, the three personality traits were added to model 24 to give model 113. The results are shown in table 7.14. In model 113, neuroticism, work locus of control, leader-member exchange and communication frequency significantly predicted burnout. Conscientiousness did not significantly predict burnout ($p = .245$), and the quadratic term for communication frequency was also nonsignificant ($p = .131$). From inspection of the standardized coefficients, it can be seen that both neuroticism and work locus of control are important predictors of burnout ($\beta = .334$, $p = .000$ and $\beta = -.363$, $p = .000$, respectively), while LMX and communication frequency are slightly less important ($\beta = -.220$, $p = .012$ and $\beta = .259$, $p = .010$, respectively). To establish the effect size, and so the relative importance of each variable, the increase in the squared partial correlation R^2 was calculated by regressing burnout onto each of the variables separately, while controlling for all of the other variables. The additional variance explained was 14.0% for neuroticism, 16.3% for work locus of control, 5.8% for communication frequency, and 5.5% for LMX. Adding the three personality variables to the model explained an additional 31.9% of variance, while adding LMX and communication frequency explained an additional 7.6%.

TABLE 7.14 Regression Analysis for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX and CF

Variable	Model 24	Model 113	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	Beta (β)
Constant	31.811*** (1.665)	30.850*** (1.402)	
Gender	-.509 (3.842)	.867 (3.244)	.019
Tenure	1.019 (4.278)	1.403 (3.591)	.028
Job Demand	.180* (.085)	.083 (.073)	.084
CONSC	- -	-.261 (.223)	-.095
NEURO	- -	.779*** (.181)	.334***
WLCS	- -	-.719*** (.074)	-.363***
LMX	-.841*** (.206)	-.469* (.184)	-.220*
CF	1.051* (.461)	1.033* (.392)	.259*
CF ²	-.155* (.074)	-.095 (.062)	-.135
<i>F</i> value	3.754**	9.476***	
Sig. <i>F</i> Change	.002	.000	
<i>R</i> ²	.163	.430	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

7.3.9 Summary of Results for Dependent Variable Burnout

When the unidimensional measure of burnout was regressed onto all three of the personality trait variables, LMX and communication frequency, while controlling for gender, tenure and job demand, it was found that neuroticism, work locus of control, LMX, and communication frequency significantly predicted burnout. The effect sizes were found to be large for neuroticism and work locus of control, and small for both communication frequency and LMX (increases in the squared partial correlations R^2 of .140, .163, .058 and .055, respectively). The effect size for the three personality factors together was large, while the effect size for LMX and communication frequency together was smaller (increases in the squared partial correlations R^2 of .319 and .076, respectively). LMX was found to mediate the relationships between all three personality traits and burnout.

7.3.10 Analysis for Dependent Variable Occupational Self-Efficacy

Occupational self-efficacy was found to be normally distributed for skewness ($z = -.014$) and to have a positive value of kurtosis, 1.96 ($z = 4.53$). This was not expected to be a problem in the analysis as underestimates of variance associated with positive kurtosis disappear in samples of more than 100 cases (Tabachnick & Fidell, 2006: 80). In analysis 7.15, the mediation of the relationships between the three personality traits and occupational self-efficacy was tested. In analysis 7.16, the relative importance of each of the five independent variables to occupational self-efficacy was investigated. In analysis 7.17, it was examined whether the three-way effect of conscientiousness, neuroticism and work locus of control on occupational efficacy was still significant when LMX and communication frequency were controlled for.

Analysis 7.15

The results of the regression analysis, to test whether LMX mediates the effects of each of the personality variables of conscientiousness, neuroticism and work locus of control, are shown in table 7.15. For conscientiousness, the Baron and Kenny (1986) four criteria for mediation were met: firstly, the relationship between conscientiousness and occupational self-efficacy was significant ($B = .539, p = .000$); secondly, the relationship between conscientiousness and LMX was significant ($B = -.359, p = .002$); thirdly, LMX still predicted occupational self-efficacy after controlling for conscientiousness ($B = .216, p = .030$); and fourthly, the relationship between conscientiousness and the occupational self-efficacy reduced when LMX was added to the equation ($B = .539, p = .000$ to $B = .462, p = .030$). The Sobel test indicated a significant ($p = .071$) indirect effect. From the bootstrapping approach, the 95% confidence interval was calculated to be .0007 to .1843. Because zero is not in the confidence interval, it can be concluded that the indirect effect is significantly different from zero at $p < .050$ (two-tailed).

TABLE 7.15 Regression Analyses for Dependent Variable Occupational Self-Efficacy (OCCESEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS and LMX

Variable	Model 58	Model 114	Model 59	Model 115	Model 60	Model 116
	<i>B</i> (<i>s.e.</i>)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)
Constant	73.888*** (.717)	73.865*** (.705)	74.017*** (.702)	73.973*** (.689)	74.167*** (.717)	74.102*** (.703)
Gender	1.945 (2.034)	1.972 (2.002)	1.005 (1.985)	1.168 (1.949)	.413 (2.033)	.660 (1.996)
Tenure	2.270 (2.259)	2.492 (2.226)	2.030 (2.211)	2.315 (2.173)	1.105 (2.258)	1.512 (2.220)
Job Demand	-.014 (.044)	-.025 (.044)	-.026 (.044)	-.036 (.043)	.017 (.046)	.001 (.045)
CONSC	.539*** (.124)	.462*** (.127)	- -	- -	- -	- -
NEURO		-	-.507*** (.103)	-.453*** (.103)	-	-
WLCS		-			.396*** (.092)	.345*** (.092)
LMX		.216* (.098)		.223* (.095)		.232* (.097)
<i>F</i> value	4.978**	5.074***	6.372***	6.403***	4.926**	5.244***
Sig. <i>F</i> Change	.000	.030	.000	.020	.000	.018
<i>R</i> ²	.144	.178	.178	.215	.143	.183

Notes: *n* = 128; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 58, 59 and 60, the significance of the *F* change is from model 25.

† *p* < .1; * *p* < .05; ** *p* < .01; and *** *p* < .001.

For neuroticism, the Baron and Kenny (1986) four criteria for mediation were again met: firstly, the relationship between neuroticism and occupational self-efficacy was significant ($B = -.507, p = .000$); secondly, the relationship between neuroticism and LMX was significant ($B = -.241, p = .015$); thirdly, LMX still predicted occupational self-efficacy after controlling for neuroticism ($B = .223, p = .020$); and fourthly, the relationship between neuroticism and the occupational self-efficacy reduced when LMX

was added to the equation ($B = -.507, p = .000$ to $B = -.453, p = .000$). The Sobel test again indicated a significant ($p = .089$) indirect effect. From the bootstrapping approach, the 95% confidence interval was calculated to be $-.1559$ to $-.0046$. Because zero is not in the confidence interval, it can again be concluded that the indirect effect is significantly different from zero at $p < .050$ (two-tailed).

For work locus of control, the Baron and Kenny (1986) four criteria for mediation were also met: firstly, the relationship between work locus of control and occupational self-efficacy was significant ($B = .396, p = .000$); secondly, the relationship between work locus of control and LMX was significant ($B = .219, p = .011$); thirdly, LMX still predicted occupational self-efficacy after controlling for work locus of control ($B = .232, p = .018$) and fourthly, the relationship between work locus of control and the occupational self-efficacy reduced when LMX was added to the equation ($B = .396, p = .000$ to $B = .345, p = .018$). The Sobel test again indicated a significant ($p = .080$) indirect effect. From the bootstrapping approach, the 95% confidence interval was calculated to be $.0025$ to $.1322$. Because zero is not in the confidence interval, it is again concluded that the indirect effect is significantly different from zero at $p < .050$ (two-tailed).

Inspection of the P-P plots and the scatterplots of regression standardized residuals indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results (largest values in these analyses were 1.102, .521 and -.112, respectively). As the Baron and Kenny (1986) criteria were met, and the indirect effects were found to be significantly different from zero from both the direct Sobel test and the calculation of the confidence intervals, it is concluded that LMX mediates the effects of conscientiousness, neuroticism and work locus of control on occupational self-efficacy. The analysis was repeated using transformations for the nonnormal variables (JD^+ , $CONSC^+$ and LMX^+), and for the log terms for conscientiousness and LMX. No material differences were found in the results, and the mediation was confirmed for each set of variables. It is concluded that nonlinearity and nonnormality of the relevant independent variables did not influence the results of the analysis.

Analysis 7.16

To investigate the relative importance of each of the independent variables to occupational self-efficacy, the three personality variables were added to model 28 to give model 117. The results are shown in table 7.16.

TABLE 7.16 Regression Analysis for Dependent Variable Occupational Self-Efficacy (OCCEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, NEURO, WLCS, LMX and CF

Variable	Model 28	Model 117	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	β
Constant	73.996*** (.736)	74.010*** (.641)	
Gender	1.214 (2.084)	.995 (1.828)	.042
Tenure	1.999 (2.321)	2.117 (2.025)	.081
Job Demand	-.038 (.046)	.009 (.041)	.017
CONSC	- -	.317* (.126)	.219*
NEURO	- -	-.341** (.102)	-.278**
WLCS	- -	.274** (.086)	.263**
LMX	.242* (.110)	.043 (.102)	.038
CF	.312 (.204)	.293 (.184)	.140
<i>F</i> value	2.702*	7.363***	
Sig. <i>F</i> Change	.003	.000	
<i>R</i> ²	.104	.341	

Notes: $n = 128$; standardized and unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 28, the significance of the *F* change is from model 25.

$p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

In this model, of the five variables under consideration, only the three personality traits of conscientiousness, neuroticism and work locus of control significantly predicted occupational self-efficacy with standardized coefficients of $\beta = .219$, $p = .013$, $\beta = -.278$, $p = .001$ and $\beta = .263$, $p = .002$, respectively. Both LMX and communication frequency were found to be nonsignificant ($p = .676$ and $p = .114$), although it was expected that

communication frequency would be nonsignificant, as previously, LMX had been found to fully mediate its effect.

The three personality traits explained an additional 26.5% of variance over that of the controls, job demand, LMX and communication frequency. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results (largest values of 1.424, .322 and .137, respectively). The analysis was repeated using transformed terms for the nonnormal variables (JD, CONSC, LMX and CF). The results were not materially changed from previously.

Analysis 7.14

To investigate whether the three-way effect of CONSC \times NEURO \times WLCS was still significant when the effects of LMX and communication frequency were controlled for, the interaction terms were added to model 117 to give model 118, and then the three-way term was added to give model 119. The three-way term was still found to be significant ($p = .027$). The increase in the squared partial correlation R^2 was .043, and the adjusted R^2 increased by .024. As each of the three criteria for inclusion of higher order terms in an equation as suggested by Cohen et al. (2003) are met, it is concluded that the three-way interaction is still significant when controlling for LMX and communication frequency. Repeating the analysis with transformed independent variables did not result in a material change to these results. The results are shown in table 7.17.

7.3.11 Summary of Results for Dependent Variable Occupational Self-Efficacy

When occupational self-efficacy was regressed onto all five of the variables, while controlling for gender, tenure and job demand, only the three personality variables were found to significantly predict occupational self-efficacy. Neuroticism and work locus of control were found to have an almost equal but opposite effect on occupational self-efficacy, while conscientiousness had a slightly smaller effect size (increase in the squared partial correlations R^2 of .090, .082 and .050 respectively, as each of the terms was added while controlling for the other four variables, job demand and the controls). The three personality variables explained an additional 26.5% of variance. LMX was found to partially mediate all three of the personality variables in their relationship with occupational self-efficacy. The three-way interaction between conscientiousness, neuroticism and work locus of control was still found to be significant when LMX and communication frequency were controlled for.

TABLE 7.17 Regression Analyses for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender, Tenure and Mean-Centered JD, CF, CONSC, NEURO and WLCS

Variable	Model 117	Model 118	Model 119
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	74.010***	74.180***	74.212***
Gender	.995	1.436	1.099
Tenure	2.117	2.575	2.531
Job Demand	.009 (.041)	.020 (.041)	.024 (.041)
CONSC	.317* (.126)	.336** (.125)	.303* (.124)
NEURO	-.341** (.102)	-.309*** (.102)	-.275** (.101)
WLCS	.274** (.086)	.239** (.087)	.130 (.099)
NEURO × WLCS	- -	.024 [†] (.013)	.020 (.013)
CONSC × NEURO	- -	.022 (.019)	.021 (.019)
CONSC × WLCS	- -	.016 (.017)	.021 (.017)
CONSC × NEURO × WLCS	- -	- -	-.004* (.002)
LMX	.043 (.102)	.066 (.103)	.073 (.101)
CF	.293 (.184)	.289 (.183)	.252 (.180)
<i>F</i> value	7.363***	6.046***	6.159***
Sig. <i>F</i> Change	.000	.116	.027
<i>R</i> ²	.341	.375	.402
<i>Adjusted R</i> ²	.294	.313	.337

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For convenience the standard errors are not shown for the constant, gender and tenure.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

7.4 DISCUSSION

7.4.1 Personality, Leadership, Burnout and Occupational Self-Efficacy

A prime objective of this study was to investigate whether personality or leadership was more important in the development of burnout and occupational self-efficacy. The results of this chapter suggest that personality is more important than leadership, for both of the outcomes for individuals. The three personality traits explained an additional 31.9% of variance for burnout and 26.5% of occupational self-efficacy. LMX and communication frequency explained an additional 7.6% of variance for burnout and did not significantly predict occupational self-efficacy, when the effects of the personality traits were partialled out. However, LMX was found to mediate the relationships between each of the personality traits and their relationships with each of the personal outcomes. In all cases, except for depersonalization, either work locus of control or neuroticism was found to be the most important predictor of burnout and occupational self-efficacy.

For emotional exhaustion, neuroticism was found to be the most important predictor, followed by work locus of control, then communication frequency, and then LMX (increases in the squared partial correlations R^2 of .190 for neuroticism, .077 for work locus of control, .052 for communication frequency, and .034 for LMX). This finding is as expected, because emotional exhaustion is the closest component of burnout to traditional stress reactions (Cordes & Dougherty, 1993), with the facets of neuroticism consisting of anxiety, hostility, depression, self-consciousness, impulsiveness and vulnerability (Costa & McCrae, 1992; cited in Spangler et al., 2004: 255). The three personality factors explained an additional 26.3% of variance, while LMX and communication frequency explained an additional 9.8%. This emphasizes the important role of personality in the development of burnout, as emotional exhaustion is considered to be the central variable in terms of understanding the burnout process (Cordes & Dougherty, 1993; Cropanzano et al., 2003). The curvilinear communication frequency and linear LMX interaction was still found to significantly predict emotional exhaustion when the effect of the three personality traits were controlled for. This emphasizes the importance of positive relationships and communication with the line manager in the development of burnout. Individuals in high-quality LMX relationships and who have frequent communication receive social support from their managers, while those in low-quality exchanges with high communication frequency were seen to suffer the highest levels of emotional exhaustion.

The importance of the quality of the LMX relationship with their manager was also reflected in the finding that LMX was the most important predictor of depersonalization. This is an interesting finding, and is consistent with the predictions of the job demands-resource model (Demerouti et al., 2001; Schaufeli & Bakker, 2004). In terms of the model, LMX can be considered as a job resource, as these are defined as the physical, psychological, social or organizational aspects of a job that contribute to the

achievement of work-related goals, reduce job demands or the costs associated with them, and stimulate personal growth and development (Demerouti et al., 2001). The finding is consistent with the model, as the model predicts that job resources are primarily and negatively associated with depersonalization. Work locus of control was found to be the second highest predictor of both emotional exhaustion and depersonalization (increases in the squared partial correlations R^2 of .077 and .045, respectively). It was also found to be the only significant predictor of reduced personal accomplishment (increase in the squared partial correlations R^2 of .077). Overall, it was found to have the largest effect size of all of the variables on the unidimensional measure of burnout (increases in the squared partial correlations R^2 of .163 for work locus of control, .140 for neuroticism, .058 for LMX, and .055 for communication frequency). The strength of the relationship between work locus of control and reduced personal accomplishment is consistent with the significant prior research that has supported a strong relationship between internality and performance across a wide range of settings and circumstances (see, for example, Boone et al., 1996; Blau, 1993; Judge & Bono, 2001; Ng et al., 2006), and it seems reasonable from this to expect that internals will accomplish more and so judge themselves to have lower levels of reduced personal accomplishment. That work locus of control had high predictability of emotional exhaustion and the highest effect size on the unidimensional measure of burnout, provides support for Pines (1993) assertion that goal attainment and success are critical antidotes to burnout. It is also consistent with the extensive prior research that shows that external individuals are more vulnerable and suffer higher levels of stress (see, for example, James & Wright, 1993; Spector 1986). It is also in line with Lefcourt's (1976) observation that internals are more resilient.

Each of the three personality traits was found to significantly predict occupational self-efficacy when LMX and communication frequency were controlled for, and the three-way interaction between conscientiousness, neuroticism and work locus of control was still significant. This emphasizes the importance of the individual's personality on their assessments of their self-efficacy. This finding is consistent with Bandura's (1986) assertion of a triadic reciprocal causality model involving behaviour, cognitions and the environment dynamically influencing each other. It also resonates with Bandura's statement that it is the individual's beliefs, rather than what is objectively the case, that will influence an individual's motivation, affective state and actions (Bandura, 1995). The finding of the three-way interaction provides strong support for Gist and Mitchell's (1992) posited process of self-efficacy formulation. In particular, the importance of an individual's attributional analysis of their prior experiences and the emphasis on the central importance of the assessment of the self in an individual's self-efficacy development are supported by the findings.

Although it is suggested that LMX is less important than the personality factors considered, particularly of neuroticism and work locus of control, LMX was found to

mediate the relationships between each of the personality variables and burnout and its components, as well as occupational self-efficacy. While the personality variables each had direct effects on burnout, its components, and on occupational self-efficacy, it is indicated that personality influences the quality of the relationship developed and maintained with their manager. This has further effect on the personal outcomes of burnout and occupational self-efficacy.

The effect of the weak environment conditions affecting the strength of the relationships with the personal outcomes in this study has already been discussed. From the levels of autonomy that are indicated from the average communication frequency scores reported (less than once or twice per week, but more than monthly), and from the observation that many of the resources would be made available to the individuals from central government or other government agencies rather than their line manager, it may be that in this study the impact of LMX and communication frequency are lower than what may be the case in a more traditional hierarchical structure or for more junior managers, where the immediate supervisor has more control over the resources and opportunities that can be provided to the employee. Further research will be required to determine whether this is the case. While it is not possible to generalize from these findings, from consideration of the environmental conditions in this study, it seems possible to speculate that if LMX and communication frequency were found to be important factors in the development of burnout in this study, then it is likely they will be found to be important in more traditional hierarchical organizations as well.

7.4.2 Conclusions

In summary, the results show that the three personality traits – conscientiousness, neuroticism and work locus of control - are important factors in the development of burnout and occupational self-efficacy and are antecedent factors in the quality of the relationships that individuals will develop with their managers. Together, these factors will have important effects on the personal outcomes of burnout and occupational self-efficacy. The findings also support the speculation by Ng et al. (2006) that locus of control plays an important role in the work place and has at least, if not more, significant predictive power than the Big Five personality factors.

The results of this study may be influenced by the environmental conditions which may have positively affected the results for the strength of the personality relationships and reduced the strength of the relationships between leadership and the outcomes. Although the results are not generalizable, it is expected that the quality of their LMX relationship and frequency of communication with their manager will also be more important for individual's personal outcomes of burnout and occupational self-efficacy for employees in organizations with a more traditional structure. Further research is required to determine if this is the case.

CHAPTER 8

THE IMPACT OF OCCUPATIONAL SELF-EFFICACY AND THE PERSONALITY TRAITS OF CONSCIENTIOUSNESS AND WORK LOCUS OF CONTROL ON BURNOUT

8.1 INTRODUCTION

In the previous chapters, occupational self-efficacy has been considered as a dependent variable. However, Bandura (1995: 1) contends that a “strong sense of self-efficacy in socially valued pursuits is conducive to human attainment and well-being,” and Maddux and Lewis (1995) argue that strong beliefs about personal ability and competence result in adaptive emotional states, while low efficacy beliefs lead to distressing emotional states and cognitive and behavioural ineffectiveness. Jex et al. (2001) argue that there are strong theoretical reasons as to why self-efficacy should affect the relationship between occupational stressors and employee well-being, and note that there have been few studies into the moderating role of self-efficacy on the stress-strain relationship. The limited available and research findings are mixed.

In this chapter, the impact of occupational self-efficacy on burnout and each of the components is investigated. Whether occupational self-efficacy moderates the relationship between job demand and burnout is also examined. Walsh (2004: 152) has suggested that self-efficacy and personality may interact to facilitate well-being, while Barrick and Mount (2005) have observed “that personality is a distal motivational force, which influences behaviour through proximal performance motivation variables like goals, self-efficacy and expectancies” (Barrick & Mount, 2005: 366). Following these comments and from consideration of relevant theory, a hypothesis for a three-way interaction between occupational self-efficacy, conscientiousness and work locus of control in the prediction of burnout is proposed, and subsequently investigated.

8.2 PREVIOUS RESEARCH, THEORY AND HYPOTHESES

Self-efficacy (Bandura, 1986; 1989) (see section 2.2) refers to an individual’s belief in their capabilities to organize and execute courses of action to successfully perform and manage in different situations. Occupational self-efficacy can be defined as “one’s belief in one’s own ability and competence to perform successfully and effectively in situations and across different tasks in a job” (Schyns & von Collani, 2002). As previously discussed, efficacy beliefs are the product of a complex process of self-persuasion that relies on cognitive processing of diverse sources of efficacy information (Bandura, 1989). Self-efficacy has been argued to be an important factor for individual well-being (Bandura, 1989; Maddux & Lewis, 1995). Individuals low in self-efficacy have been found to be more prone to self-doubts, worry more, have higher coping deficiencies, suffer from higher levels of anxiety arousal, feel more responsible for

failure than success, and regard feedback as an evaluation of personal rather than performance value (Jerusalem & Mittag, 1995). Self-efficacy has been found to be positively related to work overload perceptions (Jex & Bliese, 1999), psychological strain (Jex & Bliese, 1999; Jex et al., 2001), and mental distress (Jex et al., 2001). Positive self-efficacy beliefs have also been found to be negatively associated with depression, and to make positive contributions to several components of the physiological stress system (O'Leary & Brown, 1995). Self-efficacy is concerned with judgments of what an individual can do with their skills and resources (Walsh, 2004), and is an important determinant of an individual's motivation, affective state and actions (Bandura, 1989). Individuals who are high in self-efficacy set higher goals for themselves, are more persistent, have greater cognitive efficiency, search for more solutions for problems, are more likely to remain task focused, and are less likely to become self-diagnostic and reflect on personal inadequacies (Maddux & Lewis, 1995). Individuals with high self-efficacy beliefs also view challenging events as less stressful than those low in self-efficacy (Bandura, 1995). As previously mentioned, occupational stress arises when, firstly, the source of stress is perceived negatively and, secondly, the individual adopts inadequate coping styles (Clarke & Cooper, 2000). It therefore follows that self-efficacy may act as a buffer between job demands and stress. As previously mentioned, although burnout is considered as a measure of energy depletion and dysfunctional attitudes at work, it can be considered as a prolonged stress measure (Schaufeli & Enzmann, 1998). Also, the component of emotional exhaustion can be regarded conceptually as the most similar to orthodox stress variables (Maslach, 1993; Cordes & Dougherty, 1993). It is therefore predicted that occupational self-efficacy will moderate the relationship between job demands and emotional exhaustion and job demands and burnout.

There have been few studies into the moderating role of self-efficacy on the stress-strain relationship, and research findings have been mixed (Jex et al., 2001). For example, Jex and Gudanowski (1992) found little evidence of moderation, whilst Jex and Bliese (1999) found moderation of several stress-strain relationships. In a study of two separate samples of 110 American health professionals and 214 American employees of a large contracting firm, Schaubroeck and Merritt (1997) found that self-efficacy moderated the relationship between perceived job demand and stress (as measured by both systolic and diastolic blood pressure). In a study of 260 Dutch bank employees, van Yperen and Snijders (2000) found that self-efficacy moderated the relationship between job demands and psychological health. In a study of 714 Dutch employees, Xanthopoulou et al. (2007) examined the role of three personal resources - self-efficacy, organizational-based self-esteem and optimism - in the job demands-resources model. No evidence was found of a moderation of the relationship between job demand and emotional exhaustion. Instead, the evidence indicated mediation of the

relationship between job resources and emotional exhaustion by personal resources. The following hypotheses are proposed for investigation:

- Hypothesis 60** *Occupational self-efficacy is negatively related to emotional exhaustion.*
- Hypothesis 61** *Occupational self-efficacy is negatively related to depersonalization.*
- Hypothesis 62** *Occupational self-efficacy is negatively related to reduced personal accomplishment.*
- Hypothesis 63** *Occupational self-efficacy is negatively related to burnout.*
- Hypothesis 64** *The relationship between job demand and emotional exhaustion is moderated by occupational self-efficacy.*
- Hypothesis 65** The relationship between job demand and burnout is moderated by occupational self-efficacy.

As mentioned earlier, Barrick and Mount (2005) observe “that personality is a distal motivational force, which influences behaviour through proximal performance motivation variables like goals, self-efficacy and expectancies” (Barrick & Mount, 2005: 366) and Walsh (2004: 152) suggests that self-efficacy and personality may interact to facilitate well-being. Although limited, prior research has provided some support for these interactions. Conscientiousness (LePine et al., 2004) and locus of control (Rotter, 1966) pertain to feelings of control and positive coping styles (Connor-Smith & Flachsbart, 2007; Wanberg, 1997; Watson & Hubbard, 1996). Research by Schaubroeck and Merritt (1997) found a significant interaction between generalized self-efficacy and perceptions of control in the prediction of blood pressure. Their findings suggested that a lack of perceived job control may be particularly harmful for individuals high in self-efficacy in demanding circumstances. Research by Jex et al. (2001), in a study of 2,293 members of the U. S. Army, found evidence of two three-way interactions with self-efficacy, stressors and coping styles in the prediction of psychological strain. The two three-way interactions involved self-efficacy, role clarity and active coping, on the one hand, and self-efficacy, work overload and avoidance coping on the other hand.

Both locus of control and self-efficacy are concerned with predictions about behaviour. An individual’s belief in their self-efficacy is an assessment of their judgment of whether they have the capabilities to organize and execute a course of action to achieve a particular outcome (Bandura, 1986). Locus of control relates to an individual’s beliefs in external vs. internal control of reinforcement (Rotter, 1996). Locus of control thus refers to beliefs about the link between behaviour and outcomes, while self-efficacy refers to beliefs about capabilities and capacities (Antonovsky, 1991). That is, locus of control concerns the extent to which an individual believes that their behaviour controls the outcome, while self-efficacy is about confidence in their ability to perform certain

behaviours (Maddux, 1995). It seems reasonable to expect that these two beliefs will interact in their relationships with well-being. Fusilier et al. (1987) suggest that an internal locus of control may be useful in responding to stress only when resources are available. Further, they suggest that internals will feel compelled to cope, and will become frustrated and strained, if they do not have the internal resources to do so. It follows that work locus of control and self-efficacy will interact in their relationship with emotional exhaustion. For example, individuals high in self-efficacy may not be motivated to act if they have a high level of externality and do not believe that their actions will affect the outcome, and internal individuals will become stressed if they judge that they do not have adequate personal resources and capabilities to overcome the stressful event.

Further, conscientiousness refers to the level of self-discipline, organizational ability and efficiency an individual possesses for the carrying out of tasks (Spangler et al., 2004), and the level of planning they engage in (Costa et al., 1991). Those low in conscientiousness tend to be easy-going, negligent, disorganized, lazy and aimless (Barrick & Mount, 2004). Conscientiousness has also been found to be a powerful predictor of positive coping styles such as problem-solving (Connor-Smith & Flachsbart, 2007; Watson & Hubbard, 1996) and cognitive reappraisal (Connor-Smith & Flachsbart, 2007). It can be expected that even when an individual is highly internal in their locus of control and has a high self-efficacy, this may not be sufficient if they are lacking in planning and organizational ability, self-discipline and efficiency, and fail to adopt positive coping styles. Thus, it may be that the interaction between occupational self-efficacy and locus of control will be moderated by conscientiousness in predicting emotional exhaustion. The following hypotheses are therefore proposed for testing:

Hypothesis 66 *The three-way interaction between work locus of control, occupational self-efficacy and conscientiousness is significantly related to emotional exhaustion.*

Hypothesis 67 *The three-way interaction between conscientiousness, work locus of control and occupational self-efficacy is significantly related to burnout.*

8.3 ANALYSIS AND RESULTS

8.3.1 Initial Analysis

All scales used in the analyses were found to have adequate reliability with Cronbach's alphas above $\alpha = .7$ (see table 3.1). Descriptive statistics for the variables are shown in table 3.22. Work locus of control and the unidimensional measure of burnout were found to be normal in distribution of scores. Nonlinear transformations (see section 3.3.7) were used in the analysis to confirm the effects of the nonnormality

of the other variables on the results. Bivariate correlations for the variables were previously calculated, and are shown in table 5.1.

To check if common-method variance (Podsakoff & Organ, 1986) was a problem, Harmon One-Factor tests (see section 3.4.2) were conducted for each of the analyses. For the emotional exhaustion, depersonalization, reduced personal accomplishment and unidimensional measure of burnout the first factor extracted accounted for 20.1%, 19.5%, 20.0% and 18.4%, respectively. As no single factor emerged from the analysis and one general factor did not account for the majority of the covariance in the independent and dependent variables, it is suggested that common-method variance is not a pervasive problem in these analyses.

As a further check, a confirmatory factor analysis was conducted to confirm that the items loaded cleanly onto their respective constructs. The results are shown in tables A-8.1, A-8.2, A-8.3 and A-8.4 (see appendix 8.1). For convenience, only loadings above $\pm .40$ are shown. As can be seen from the tables, the items loaded cleanly onto their respective factors. None of the small number of cross-loadings observed were found to have values above $.48$, which indicates they were not significant. Further, none of the cross-loadings were on dependent and independent variables. Therefore, they are not expected to have caused a problem in the analysis.

8.3.2 Analysis for Dependent Variable Emotional Exhaustion

In analysis 8.1, the relationship between occupational self-efficacy and emotional exhaustion and whether occupational self-efficacy and job demand significantly interacted to predict emotional exhaustion were investigated. As previously, as emotional exhaustion was found to be nonnormal (see section 3.3.7), the initial analysis was conducted for the transformed dependent variable $EE^+ = \text{SQRT}(EE)$ (see section 3.3.7). In analysis 8.2, the analysis was repeated for the untransformed dependent variable, and the results were compared to those from the previous analysis. In analysis 8.3, the significance of the three-way interaction between work locus of control, occupational self-efficacy and conscientiousness in the prediction of EE^+ was tested. In analysis 8.4, this was repeated after having removed a number of cases to ensure that the significance of the three-way effect was not dependent on a small number of cases. In analysis 8.5, the effect of the nonnormality of conscientiousness on the results was confirmed. In analysis 8.6, post hoc probing of the three-way interaction was conducted. In analysis 8.7, the significance of the three-way interaction was tested while including neuroticism as a control variable. In analysis 8.8, the previous analysis was repeated for the untransformed dependent variable emotional exhaustion, and the results were compared to those from the previous analysis.

Analysis 8.1

Occupational self-efficacy was found to be normally distributed for skewness ($z = -.014$) and to have a positive value of kurtosis, 1.96 ($z = 4.53$) (see section 3.3.7). This was not expected to be a problem in the analysis as underestimates of variance associated with positive kurtosis disappear in samples of more than 100 cases (Tabachnick & Fidell, 2006: 80). To test Hypothesis 60, the OCCSEFF term was added to the base model (model 1[†]) to give model 120[†]. To test Hypothesis 64, the product term OCCSEFF × JD was then added to this model to give model 121[†]. The results are shown in table 8.1.

TABLE 8.1 Regression Analysis for Dependent Variable Transformed Emotional Exhaustion (EE[†]) and Independent Variables Gender, Tenure and Mean-Centered JD, and OCCSEFF

Variable	Model 1 [†]	Model 120 [†]	Model 121 [†]
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	3.692*** (.113)	3.678*** (.106)	3.688*** (.106)
Gender	-.255 (.320)	-.195 (.300)	-.273 (.305)
Tenure	-.098 (.356)	-.015 (.334)	-.088 (.338)
Job Demand	.007 (.007)	.006 (.007)	.005 (.007)
OCCSEFF		-.054*** (.013)	-.048** (.013)
OCCSEFF × JD			-.001 (.019)
<i>F</i> value	.568	4.961**	4.330**
Sig. <i>F</i> Change	.637	.000	.197
<i>R</i> ²	.014	.144	.156

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable EE[†] = SQRT (EE).

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As predicted, occupational self-efficacy was found to be negatively related to emotional exhaustion with an unstandardized coefficient of $B = -.054$, $p = .000$ (model 120[†]). The increase in the squared partial correlation R^2 of .132 when the OCCSEFF term was added indicates a moderate effect size. Hypothesis 60 is supported. The coefficient of the product terms $OCCSEFF \times JD$ was nonsignificant ($p = .197$), indicating that there was not an interaction effect between job demand and occupational self-efficacy in the prediction of emotional exhaustion. Hypothesis 64 is not supported. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of the Cook's distances and values of $DFBETA$ indicated no effect of outliers on the results (maximum values for model 120[†] of .137 and .010, respectively).

TABLE 8.2 Regression Analysis for Dependent Variable Emotional Exhaustion (EE) and Independent Variables Gender, Tenure and Mean-Centered JD and OCCSEFF

Variable	Model 1	Model 120	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>Beta</i> (β)
Constant	14.182*** (.868)	14.709*** (.820)	
Gender	-1.659 (2.456)	-1.227 (2.322)	-.046
Tenure	-.387 (2.733)	.212 (2.586)	.007
Job Demand	.075 (.054)	.065 (.051)	.110
OCCSEFF		-.385*** (.098)	-.338***
<i>F</i> value	.795	4.525**	
Sig. <i>F</i> Change	.499	.000	
R^2	.020	.133	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Analysis 8.2

The first part of analysis 8.1 was repeated for the untransformed variable emotional exhaustion. The results are shown in table 8.2 above. As can be seen, the results are not materially different than before. It is concluded that occupational self-efficacy is negatively related to emotional exhaustion with a moderate effect size.

Analysis 8.3

To explore the three-way interaction term between work locus of control, occupational self-efficacy and conscientiousness, and to test Hypothesis 66, the three variables WLCS, OCCSEFF and CONSC were added to model 1⁺ to give model 122⁺. The product terms WLCS × OCCSEFF, WLCS × CONSC, and OCCSEFF × CONSC were then added to give model 123⁺. The three-way interaction term was then added to give model 124⁺. The results are shown in table 8.3. In model 122⁺, occupational self-efficacy, conscientiousness and work locus of control were all found to be negatively related to emotional exhaustion with unstandardized coefficients of $B = -.032$, $p = .023$, $B = -.041$, $p = .036$ and $B = -.032$, $p = .026$, respectively. The standardized coefficients in this model demonstrate the relative equality in the importance of these three variables. These were $\beta = -.217$ for occupational self-efficacy, $\beta = -.190$ for conscientiousness, and $\beta = -.206$ for work locus of control. The addition of the three two-way interaction terms did not result in a significant change, none of the terms were found to be significant, and the adjusted R^2 declined. In model 124⁺, the three-way interaction term WLCS × OCCSEFF × CONSC was found to have a significant unstandardized coefficient of $B = -.001$, $p = .004$. Cohen et al. (2003: 211) state that when considering whether to include higher-order terms in an equation, there are no hard rules. They suggest that one of the following criteria may be employed:

1. the loss (or gain) in prediction attributed to the highest-order term employing some conventional level of significance. As the three-way term was added to the equation, the significance of the F change was $p = .004$.
2. the change in R^2 . Cohen et al. (2003: 211) suggest that increases of squared partial correlations of .02, .13, and .26 are reflective of small, moderate and large effect sizes, respectively. The change in the squared semipartial correlation for the addition of the three-way term was .074, indicating a small to moderate effect size.
3. the change in the *adjusted* R^2 . They suggest that a reasonable criterion for deciding between two equations is when the *adjusted* R^2 change is between .02 and .05. In this case, the adjusted R^2 change was above these values at .055.

As all three criteria suggested by Cohen et al. (2003: 211) are met, Hypothesis 52 is supported. It is concluded that work locus conscientiousness, occupational self-efficacy and conscientiousness interact significantly in the prediction of emotional

TABLE 8.3 Regression Analyses for Dependent Variable Transformed Emotional Exhaustion (EE[†]) and Independent Variables Gender, Tenure and Mean-Centered JD, CONSC, WLCS and OCCSEFF

Variable	Model 122 [†]	Model 123 [†]	Model 124 [†]
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	3.686*** (.103)	3.687*** (.107)	3.687*** (.104)
Gender	-.223 (.293)	-.246 (.307)	-.271 (.297)
Tenure	-.065 (.325)	-.066 (.336)	-.143 (.326)
Job Demand	.002 (.007)	.002 (.007)	.000 (.007)
WLCS	-.032* (.014)	-.033* (.014)	-.015 (.015)
OCCSEFF	-.032* (.014)	-.032* (.014)	-.012 (.015)
CONSC	-.041* (.019)	-.040* (.020)	-.026 (.020)
WLCS × OCCSEFF		.000 (.002)	.001 (.002)
WLCS × CONSC		.001 (.003)	.001 (.003)
OCCSEFF × CONSC		-.001 (.003)	-.002 (.003)
WLCS × OCCSEFF × CONSC			-.001** (.000)
<i>F</i> value	5.231***	3.425**	4.178***
Sig. <i>F</i> Change	.000	.978	.004
<i>R</i> ²	.213	.214	.272
Adjusted <i>R</i> ²	.172	.152	.207

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

exhaustion. Inspection of the P-P plot and the scatterplot of regression standardized residuals (see figures A-8.1 and A-8.2, respectively, in appendix 8) showed no violations of assumptions. The maximum value for the Variance Inflation Factor (VIF) in the analysis was 2.11 indicating multicollinearity was not a problem. The maximum Cook's distance and value of *DFBETA* in this analysis were .117 and .012, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients.

Analysis 8.4

Despite the results of the Cook's distance and the *DFBETA* values, to ensure that the results were not dependent on a few outliers, the analysis was repeated with eight cases with Mahalanobis distances higher than the guide value of 25.74 (see section 3.3.6). The results again supported the three-way interaction, with the three criteria suggested by Cohen et al. (2003) again met. The significance of the *F* change was $p = .041$. The increase of the squared partial correlation R^2 was .039. The adjusted R^2 increased by .030.

Analysis 8.5

To confirm that the results were not affected by the nonnormality of conscientiousness, the analysis was repeated using the transformed variable for $CONSC^+$. For completeness, the transformed variable JD^+ was also used. The results were not materially different. The significance of the three-way interaction term was $p = .005$. The increase of the squared partial correlation R^2 was .067, and the adjusted R^2 increased by .051. It is concluded that the nonnormality of conscientiousness did not unduly influence the results.

Analysis 8.6

Aiken and West (1991: 50) suggest that if a three-way interaction is found to be significant, then it should be probed to assist with interpretation. Four separate simple regression equations were generated for the combinations of WLCS and CONSC at values of ± 1.0 standard deviation from the mean, where the standard deviations for the independent variables WLCS and CONSC were 7.21 and 5.21, respectively. The computer approach suggested by Aiken and West (1991: 54) was conducted to confirm the simple slope equations, and to conduct *t*-tests to confirm whether the slopes were significantly different from zero. The slopes were plotted for high and low conscientiousness, at values of high and low work locus of control (see figures 8.1 and 8.2, respectively), by substituting values of the variables one standard deviation above and below the mean into these four regression equations. In figure 8.1, the slope for $CONSC_H$ was found to be significantly different from zero ($p = .020$), but the slope for $CONSC_L$ was not ($p = .388$). In figure 8.2, the slope for $CONSC_H$ was not found to be

significantly different from zero ($p = .887$), but the slope for $CONSC_L$ was ($p = .085$).

FIGURE 8.1 Interaction between Conscientiousness and Occupational Self-Efficacy for High Work Locus of Control Predicting Transformed Emotional Exhaustion

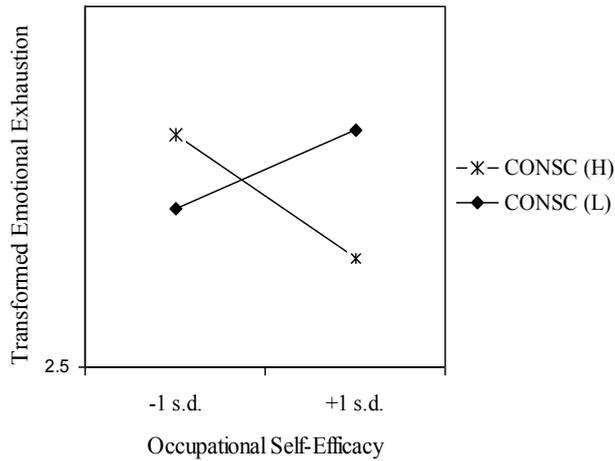
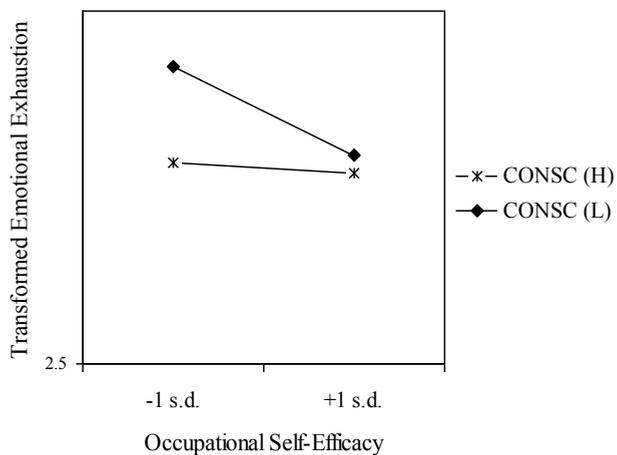


FIGURE 8.2 Interaction between Conscientiousness and Occupational Self-Efficacy for Low Work Locus of Control Predicting Transformed Emotional Exhaustion



The equations were:

$$\text{At CONSC}_H \text{ and WLCS}_H \quad \hat{Y} = -.046 \times \text{OCCESFF} + 3.446 \quad (\text{Equation 8.1})$$

$$\text{At CONSC}_L \text{ and WLCS}_H \quad \hat{Y} = .029 \times \text{OCCESFF} + 3.593 \quad (\text{Equation 8.2})$$

$$\text{At CONSC}_H \text{ and WLCS}_L \quad \hat{Y} = -.004 \times \text{OCCESFF} + 3.600 \quad (\text{Equation 8.3})$$

$$\text{At CONSC}_L \text{ and WLCS}_L \quad \hat{Y} = -.032 \times \text{OCCESFF} + 3.921 \quad (\text{Equation 8.4})$$

In figure 8.1, the plot of equation 8.1 is as expected, and indicates that when work locus of control is internal and conscientiousness is high, then as occupational self-efficacy increases emotional exhaustion will decrease. The slope of the plot for equation 8.2 is positive, which could indicate that when work locus of control is external, an increase in occupational self-efficacy may result in an increase in emotional exhaustion if conscientiousness is low; however, it must be noted that the simple slope was found to be nonsignificant ($p = .388$).

The plot for equation 8.3 in figure 8.2 is as expected, and indicates that when work locus of control is external, even for the case of high conscientiousness an increase in occupational self-efficacy is not associated with a decrease in emotional exhaustion. The plot of equation 8.4 is harder to understand. The slope was found to be significant ($p = .085$), and appears to support a negative relationship between occupational self-efficacy and emotional exhaustion when work locus of control is external and conscientiousness is low. Rather than try to provide a suitable explanation of this finding, it was decided to conduct further investigation.

Analysis 8.7

As discussed previously, individuals who are high in neuroticism tend to be nervous, suffer from high levels of worry, are emotional and insecure, have feelings of inadequacy (Costa et al., 1986) and tend to view the world through a negative lens (Bono & Judge, 2004). Prior research has consistently found neuroticism to be related to all three components of burnout (see, for example, Bakker et al., 2006; Deary et al., 1996; Francis et al., 2004; Hetland et al., 2007; LePine et al., 2004; Piedmont, 1993; Zellars et al., 2000). Watson and Pennebaker (1989) comment that as measures of stress are highly correlated with neuroticism and negative affectivity, and individuals high in neuroticism are likely to report high levels of stress, and probably high levels of burnout. For these reasons, it was decided to repeat the analysis while controlling for neuroticism. The results are shown in table 8.4 (for convenience, only the coefficients are shown).

The three-way interaction term $\text{WLCS} \times \text{OCCSEFF} \times \text{CONSC}$ was again found to be significant with an unstandardized coefficient of $B = -.001$, $p = .018$. The significance of the F change was .018, the increase in the squared partial correlation R^2 was .051, and the adjusted R^2 increased by .029. Inspection of the P-P plot and the scatterplot of

regression standardized residuals indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of *DFBETA* indicated no issues with multicollinearity or effect of outliers on the results (maximum values in the analysis of 2.17, .137 and .008, respectively).

TABLE 8.4 Regression Analyses for Dependent Variable Transformed Emotional Exhaustion (EE^+) and Independent Variables Gender, Tenure and Mean-Centered JD, NEURO, CONSC, WLCS and OCCSEFF

Variable	Model 125 ⁺		Model 126 ⁺		Model 127 ⁺	
	<i>B</i>	β	<i>B</i>	<i>B</i>	β	
Constant	3.688***		3.707***	3.706***		
Gender	-.191	-.055	-.192	-.215	-.062	
Tenure	-.134	-.035	-.079	-.137	-.035	
Job Demand	.003	.033	.003	.002	.020	
NEURO	.073***	.404***	.078***	.071***	.391***	
WLCS	-.035**	-.229**	-.037**	-.024 [†]	-.152 [†]	
OCCSEFF	-.011	-.077	-.010	.003	.021	
CONSC	-.020	-.093	-.018	-.009	-.042	
WLCS × OCCSEFF			-.001	.000	.005	
WLCS × CONSC			.003	.002	.096	
OCCSEFF × CONSC			-.002	-.003	-.130	
WLCS × OCCSEFF × CONSC				-.001*	-.265*	
<i>F</i> value	8.444***		6.013***	6.230***		
Sig. <i>F</i> Change	.000		.640	.018		
R^2	.339		.349	.382		
Adjusted R^2	.299		.291	.320		

Notes: $n = 128$.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 125⁺, the significance of the *F* change is from model 1⁺.

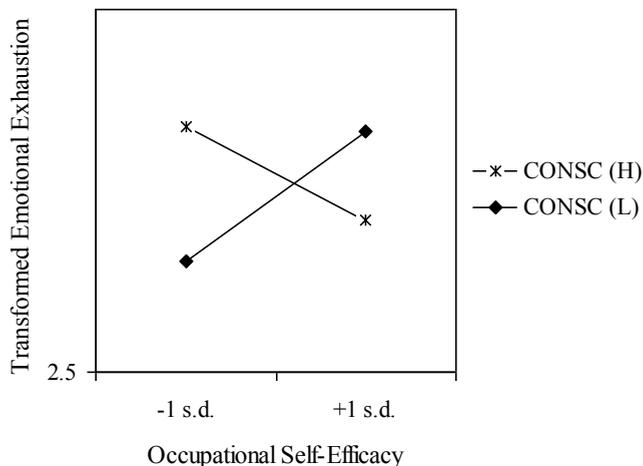
[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

The computer approach suggested by Aiken and West (1991: 54) was again conducted to confirm the simple slope equations, and conduct *t*-tests to confirm whether the slopes were significantly different to zero. The equations were:

At CONSC _H and WLCS _H	$\hat{Y} = -.034 \times OCCESFF + 3.595$	(Equation 8.5)
At CONSC _L and WLCS _H	$\hat{Y} = .048 \times OCCESFF + 3.469$	(Equation 8.6)
At CONSC _H and WLCS _L	$\hat{Y} = .007 \times OCCESFF + 3.768$	(Equation 8.7)
At CONSC _L and WLCS _L	$\hat{Y} = .00005 \times OCCESFF + 4.024$	(Equation 8.8)

Equations 8.5 and 8.7 were found not to be materially changed from the corresponding equations of 8.1 and 8.3 previously. The slope for equation 8.5 was again found to be significantly different from zero ($p = .073$, compared to $p = .020$ previously) and the slope for equation 8.7 was again found to be nonsignificant ($p = .790$, compared to $p = .887$ previously). For equation 8.6, the slope increased slightly in value (.048, compared to .029 previously). Although still nonsignificant, the probability did improve over the previous level ($p = .134$, compared to $p = .388$ previously). For equation 8.8, the value of the slope was found to be much smaller than that of equation 8.4 (.00005, compared to -.032 previously), and the slope changed from being significant ($p = .085$) to nonsignificant ($p = .988$). The slopes were again plotted for high and low conscientiousness, at values of high and low work locus of control (see figures 8.3 and 8.4, respectively), by substituting values of the variables one standard deviation above and below the mean into these four regression equations.

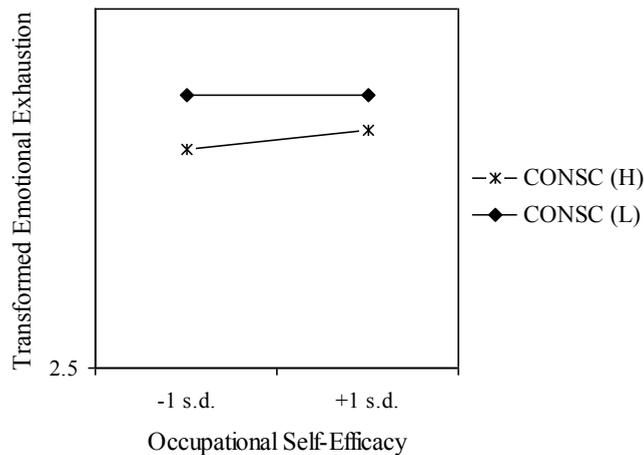
FIGURE 8.3 Interaction between Conscientiousness and Occupational Self-Efficacy for High Work Locus of Control Predicting Transformed Emotional Exhaustion



The results and plots suggest that work locus of control must be internal and conscientiousness high, for an increase in self-efficacy to be associated with a decrease in emotional exhaustion. When locus of control is external, an increase in occupational

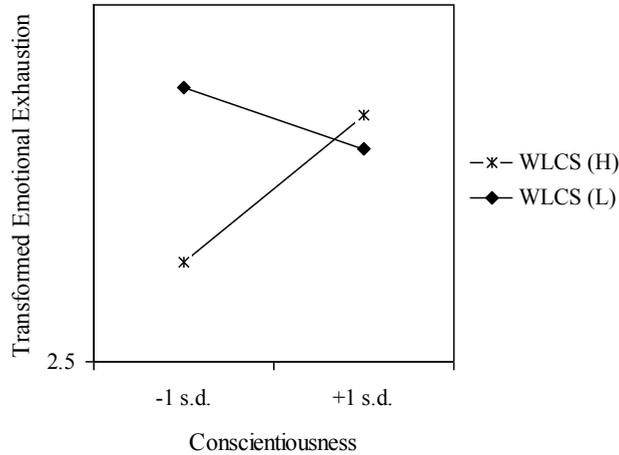
self-efficacy is not associated with a decrease in emotional exhaustion for either high or low conscientiousness. It is again predicted that when work locus of control is internal, an increase in occupational self-efficacy will result in an increase in emotional exhaustion for individuals who are low in conscientiousness, although it must be noted that the slope was still found to be nonsignificant ($p = .134$).

FIGURE 8.4 Interaction between Conscientiousness and Occupational Self-Efficacy for Low Work Locus of Control Predicting Transformed Emotional Exhaustion



To investigate this further, the equations for the regression of emotional exhaustion on conscientiousness, for different levels of work locus of control for the case of low self-efficacy were calculated, and the plot is shown in figure 8.5. For the plot of external locus of control, the slope was found to be nonsignificant ($p = .203$). The slope for internal work locus of control was found to be significant ($p = .072$), and suggests that an internal work locus of control will be associated with an increase in emotional exhaustion when occupational self-efficacy is low and conscientiousness increases. Taken together, these findings suggest that high conscientiousness and high occupational self-efficacy will only be negatively related to emotional exhaustion when work locus of control is internal. Further, an internal work locus of control will be associated with an increase in emotional exhaustion when occupational self-efficacy is low and conscientiousness is high, or possibly when self-efficacy is high and conscientiousness is low. These results are discussed more fully, and related to relevant theory, in section 8.4.1.

FIGURE 8.5 Interaction between Conscientiousness and Work Locus of Control for Low Occupational Self-Efficacy Predicting Transformed Emotional Exhaustion



Analysis 8.8

The analysis was repeated for the untransformed variable emotional exhaustion. The results are shown in table 8.5. The results were not materially different from that previously. The three-way interaction term $WLCS \times OCCSEFF \times CONSC$ was again found to be significant with an unstandardized coefficient of $B = -.004$, $p = .018$. The significance of the F change was .018, the increase in the squared partial correlation R^2 was .050, and the adjusted R^2 increased by .029. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of Variance Inflation Factors (VIF), Cook's distances and values of $DFBETA$ indicated no issues with multicollinearity or effect of outliers on the results (maximum values in the analysis of 2.173, .148 and .083, respectively).

TABLE 8.5 Regression Analyses for Dependent Variable Emotional Exhaustion (EE) and Independent Variables Gender, Tenure and Mean-Centered JD, NEURO, CONSC, WLCS and OCCSEFF

Variable	Model 125	Model 126	Model 127
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	14.787***	14.744***	14.731***
Gender	-1.194	-1.744	-1.921
Tenure	-.703	-.838	-1.282
Job Demand	.040 (.047)	.029 (.047)	.021 (.047)
NEURO	.566*** (.121)	.574*** (.124)	.524*** (.124)
WLCS	-.273** (.101)	-.290** (.102)	-.184 [†] (.109)
OCCSEFF	-.061 (.105)	-.047 (.106)	.055 (.113)
CONSC	-.149 (.141)	-.126 (.144)	-.059 (.144)
WLCS × OCCSEFF		.002 (.011)	.008 (.011)
WLCS × CONSC		.026 (.020)	.022 (.020)
OCCSEFF × CONSC		-.007 (.020)	-.016 (.020)
WLCS × OCCSEFF × CONSC			-.004* (.002)
<i>F</i> value	8.045***	5.856***	6.071***
Sig. <i>F</i> Change	.000	.480	.018
<i>R</i> ²	.329	.343	.376
<i>Adjusted R</i> ²	.288	.285	.314

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For convenience of presentation, standard errors are not shown for constant, gender or tenure.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

8.3.3 Analysis for Dependent Variable Depersonalization

Depersonalization was found to be nonnormal, and a successful transformation to normalize the scores was not found (see section 3.3.7). In analysis 8.9, the regression analysis was conducted for the untransformed depersonalization scores. As previously, the potential outlier was removed. In analysis 8.10, a Spearman Rank Order Correlation was conducted (as this is the non-parametric alternative to Pearson's product-moment correlation) to calculate the strength of the relationships between the variables. In analysis 8.11, as previously, a logistic regression analysis was conducted having categorized the depersonalization scores into two categories of *no* report of depersonalization and *some level* of depersonalization.

Analysis 8.9

To test Hypothesis 61 and investigate the relationship between occupational self-efficacy and depersonalization, the OCCSEFF term was added to model 8 to give model 128. The results are shown in table 8.6. The unstandardized coefficient was found to be nonsignificant ($p = .249$). Hypothesis 61 is not supported. As in the previous analyses of depersonalization, the results of this section do require some caution in their interpretation as some violation of the assumptions was indicated from inspection of the P-P plot, and as some level of heteroscedasticity was evident from the scatterplot of regression standardized residuals. Inspection of the Cook's distance, and values of *DFBETA* indicated no effect of outliers on the results (maximum values of .246 and -.011, respectively).

Analysis 8.10

To calculate the strength of the relationships between the variables a Spearman Rank Order Correlation was conducted. The results are shown in table 8.7. Occupational self-efficacy was again found not to be significantly related to depersonalization ($p = .229$).

Analysis 8.11

As previously, (see chapter 4), a logistic regression analysis was conducted for depersonalization coded into two categories of no depersonalization reported (41.4%) and some level of depersonalization reported (55.5%). The control variables were again entered in block 1 to give model 12. In the next step, the OCCSEFF term was added to give model 129. The results are shown in table 8.8.

TABLE 8.6 Regression Analyses for Dependent Variable Depersonalization (DEP) and Independent Variables Gender, Tenure and Mean-Centered JD, and OCCSEFF (Outlier removed)

Variable	Model 8	Model 128
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	1.640 (.227)	1.630 (.227)
Gender	-.437 (.642)	-.400 (.642)
Tenure	.340 (.749)	.501 (.760)
Job Demand	-.001 (.014)	-.001 (.014)
OCCSEFF		-.034 (.029)
<i>F</i> value	.256	.528
Sig. <i>F</i> Change	.152	.249
<i>R</i> ²	.043	.018

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 8.7 Nonparametric Correlation Spearman's Rho for Gender, Tenure, Job Demand, Occupational Self-Efficacy and Depersonalization

Variable	1	2	3	4
1. Gender	-			
2. Tenure	-.112	-		
3. Job Demand (JD)	-.018	.003	-	
4. Occupational Self-Efficacy (OCCSEFF)	.022	.110	.004	-
5. Depersonalization (DEP)	-.033	.055	.029	-.109

Tests of significance were two-tailed. $n = 128$. [†] $p < .01$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 8.8 Logistic Regression Analysis for Dependent Variable Depersonalization and Independent Variables Gender, Tenure, JD and OCCSEFF

Variable	Model 12	Model 129
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	-.065 (1.611)	3.861 (2.578)
Gender	.298 (.594)	.378 (.611)
Tenure	-.103 (.639)	.006 (.667)
Job Demand	.003 (.013)	.002 (.014)
OCCSEFF		-.052 [†] (.027)
Omnibus test of Step Sig.	.949	.044
Hosmer-Lemeshow Test (Sig.)	.429	.126
Cox & Snell <i>R</i> ²	.003	.035
Nagelkerke <i>R</i> ²	.004	.047

Notes: A value of $p > 0.05$ for the Hosmer-Lemeshow Test indicates support for the model.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

In model 129, the Omnibus test of step 2 was significant ($p = .044$), and from the Wald Test the OCCSEFF term was found to contribute to the predictive ability of the model with a coefficient of $B = -.052$, $p = .053$. The negative coefficient for OCCSEFF suggests that the higher the value of occupational self-efficacy, the less likely it is that the individual will report experiencing depersonalization. The Cox & Snell R^2 and Nagelkerke R^2 were .035 and .047, respectively, suggesting that between 3.5% and 4.7% of the variability is explained by the OCCSEFF term. There was no material difference in the results when the analysis was repeated with the potential outlier removed.

8.3.4 Analysis for Dependent Variable reduced Personal Accomplishment

Analysis 8.12

Reduced personal accomplishment was found to be nonnormal (see section 3.3.7). As previously, the analysis was conducted for both the transformed dependent variable $rPA^+ = rPA^\lambda$ (where, $\lambda = 0.7$) (see section 3.3.7) and the untransformed variable rPA , and the results were compared. To investigate the relationship between occupational self-efficacy and reduced personal accomplishment, and to test Hypothesis 62, the OCCSEFF term was added to model 15⁺ to give model 130⁺. The results are shown in tables 8.9 and 8.10.

TABLE 8.9 Regression Analyses for Dependent Variable Transformed reduced Personal Accomplishment (rPA^+) and Independent Variables Gender, Tenure and Mean-Centered JD and OCCSEFF

Variable	Model 15 ⁺	Model 130 ⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	5.790*** (.290)	5.750*** (.267)
Gender	.685 (.820)	.854 (.756)
Tenure	.319 (.913)	.554 (.842)
Job Demand	.020 (.018)	.016 (.017)
OCCSEFF		-.151*** (.032)
<i>F</i> value	.679	6.186***
Sig. <i>F</i> Change	.566	.000
<i>R</i> ²	.017	.173

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable $rPA^+ = rPA^\lambda$, (where, $\lambda = 0.7$).

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE 8.10 Regression Analyses for Dependent Variable reduced Personal Accomplishment (rPA) and Independent Variables Gender, Tenure and Mean-Centered JD and OCCSEFF

Variable	Model 15	Model 130
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	13.163*** (.883)	13.044*** (.818)
Gender	2.547 (2.497)	3.046 (2.316)
Tenure	1.068 (2.779)	1.759 (2.579)
Job Demand	.067 (.055)	.055 (.051)
OCCSEFF		-.444*** (.098)
<i>F</i> value	.883	5.932***
Sig. <i>F</i> Change	.452	.000
<i>R</i> ²	.022	.167

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the F value, the significance refers to the change in the F value between models.

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

As predicted, occupational self-efficacy was found to significantly predict and to be negatively related to reduced personal accomplishment. In model 130⁺ (with the transformed dependent variable rPA⁺ as the dependent variable), and in model 130 (with the untransformed variable as the dependent variable) the unstandardized coefficients were $B = -.151$, $p = .000$ and $B = -.444$, $p = .000$, respectively. In both models, the increase in the squared partial correlation R^2 indicated a moderate effect size ($R^2 = .159$ and $R^2 = .148$, respectively). For both models, inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of the Cook's distances and values of $DFBETA$ indicated no effect of outliers on the results (maximum values for model 130⁺ of .074 and .011, and for model 130 of .078 and .034). Hypothesis 62 is supported. The P-P plot and the scatter plot for model 130⁺ are shown in figures A-8.3 and A-8.4, respectively, (see appendix 8.2).

8.3.4 Analysis for Dependent Variable Burnout

The unidimensional measure of burnout (MBI) was found to be normal in distribution (see section 3.3.7). In analysis 8.13, the relationship between occupational self-efficacy and the unidimensional measure of burnout (MBI) was investigated, and Hypothesis 63 tested. Whether there was a significant interaction between occupational self-efficacy and job demand in the prediction of burnout (MBI) was also investigated, and Hypothesis 65 tested. In analysis 8.14, the significance of the three-way interaction between work locus of control, occupational self-efficacy and conscientiousness in the prediction of burnout (MBI) was examined. In analysis 8.15, the effect of the nonnormality of the variable CONSC on the results was confirmed. In analysis, 8.16, post hoc probing of the interaction term was conducted using the methods suggested by Aiken and West (1991: 54), and the simple slopes were plotted.

Analysis 8.13

To test Hypothesis 63, the OCCSEFF term was added to the base model, model 20, to give model 131. To test Hypothesis 65, the product term OCCSEFF \times JD was then added to this model to give model 132. The results are shown in table 8.11. As predicted, occupational self-efficacy was found to be negatively related to burnout. The unstandardized coefficient was $B = -.914$, $p = .000$ (model 131). The increase in the squared partial correlation R^2 of .236 when the OCCSEFF term was added indicates a large effect size. Hypothesis 63 is supported. The coefficient of the product terms OCCSEFF \times JD was found to be significant ($p = .025$). Further, the increase in the squared partial correlation R^2 was .043 and the increase in the adjusted R^2 was .026, which are both above the lower limits suggested by Cohen et al. (2003) for the inclusion of interaction terms in an equation (see section 3.3.3). These results support the moderating role of occupational self-efficacy on the relationship between job demand and burnout. Hypothesis 65 is supported. Inspection of the P-P plot and the scatterplot of regression standardized residuals indicated no violation of assumptions. Inspection of the Cook's distances and values of $DFBETA$ indicated no effect of outliers on the results (maximum values for model 132, of .094 and .091, respectively).

Analysis 8.14

From consideration of the results of analysis 8.9 previously, it was decided to conduct the investigation of the significance of the three-way interaction term between work locus of control, occupational self-efficacy and conscientiousness while controlling for neuroticism, gender, tenure and job demand. For this reason, the analysis started with model 54. The OCCSEFF term was added to this model to give model 133. The product terms WLCS \times OCCSEFF, WLCS \times CONSC and OCCSEFF \times CONSC were then added to give model 134, and the three-way interaction term was then added to give model 135. The results are shown in table 8.12.

TABLE 8.11 Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD and OCCSEFF

Variable	Model 20	Model 131		Model 132
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>Beta</i> (β)	<i>B</i> (<i>s.e.</i>)
Constant	29.617*** (1.442)	29.373*** (1.226)		29.573*** (1.248)
Gender	.419 (4.081)	1.445 (3.585)	.032	-.177 (3.595)
Tenure	2.217 (4.541)	3.641 (3.992)	.073	2.131 (3.979)
Job Demand	.158 [†] (.089)	.134 [†] (.079)	.136 [†]	.119 (.077)
OCCSEFF		-.914*** (.151)	-.481***	-.795*** (.158)
OCCSEFF × JD				-.022* (.010)
<i>F</i> value	1.112	10.218***		9.498***
Sig. <i>F</i> Change	.318	.000		.025
<i>R</i> ²	.027	.257		.289
<i>Adjusted R</i> ²	.003	.232		.258

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

In model 133, occupational self-efficacy and work locus of control were found to be negatively related to burnout, while neuroticism was found to be positively related. Conscientiousness was not found to significantly predict burnout in this model. The standardized coefficients for neuroticism, work locus of control and occupational self-efficacy were $\beta = .276$, $p = .001$, $\beta = -.304$, $p = .000$ and $\beta = -.217$, $p = .013$, respectively, indicating the relative effects of each of the variables on burnout. In model 134, the product terms for $WLCS \times CONSC$ and $OCCSEFF \times CONSC$ were both found to have significant coefficients ($p = .022$ and $p = .080$, respectively). In model 135, the three-way interaction term $WLCS \times OCCSEFF \times CONSC$ was found to have a significant unstandardized coefficient of $B = -.006$, $p = .030$.

TABLE 8.12 Regression Analyses for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Mean-Centered JD, NEURO, CONSC, WLCS and OCCSEFF

Variable	Model 54	Model 133	Model 134	Model 135
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	29.562*** (1.166)	29.447*** (1.141)	29.737*** (1.158)	29.720*** (1.138)
Gender	1.271 (3.325)	1.653 (3.254)	.306 (3.314)	.057 (3.261)
Tenure	1.751 (3.680)	2.550 (3.612)	2.790 (3.625)	2.166 (3.576)
Job Demand	.068 (.074)	.074 (.072)	.060 (.072)	.048 (.071)
NEURO	.798*** (.182)	.644** (.189)	.703*** (.190)	.633** (.189)
WLCS	-.732*** (.152)	-.602*** (.157)	-.656*** (.156)	-.507** (.168)
OCCSEFF	- (.173)	-.412* (.164)	-.363* (.162)	-.219 (.173)
CONSC	-.425 [†] (.219)	-.301 (.220)	-.276 (.221)	-.181 (.221)
WLCS × OCCSEFF			.007 (.017)	.015 (.017)
WLCS × CONSC			.070* (.030)	.064* (.030)
OCCSEFF × CONSC			-.055 [†] (.031)	-.067* (.031)
WLCS × OCCSEFF × CONSC				-.006* (.003)
<i>F</i> value	12.022***	11.678***	9.144***	9.036***
Sig. <i>F</i> Change	.000	.013	.081	.030
<i>R</i> ²	.383	.415	.449	.472
<i>Adjusted R</i> ²	.352	.380	.400	.420

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

Cohen et al. (2003: 211) state that when considering whether to include higher-order terms in an equation, there are no hard rules. They suggest that one of the following criteria may be employed:

1. the loss (or gain) in prediction attributed to the highest-order term employing some conventional level of significance. As the three-way term was added to the equation, the significance of the F change was $p = .030$.
2. the change in R^2 . Cohen et al. (2003: 211) suggest that increases of squared partial correlations of .02, .13, and .26 are reflective of small, moderate and large effect sizes, respectively. The change in the squared semipartial correlation for the addition of the three-way term was .042, indicating a small to moderate effect size.
3. the change in the *adjusted* R^2 . They suggest that a reasonable criterion for deciding between two equations is when the *adjusted* R^2 change is between .02 and .05. In this case, the *adjusted* R^2 change was .020.

As all three criteria suggested by Cohen et al. (2003: 211) are met, Hypothesis 67 is supported and work locus of control, occupational self-efficacy and conscientiousness interact in the prediction of burnout.

Inspection of the P-P plot and the scatterplot of regression standardized residuals (see figures A-8.5 and A-8.6, respectively, in appendix 8.2) showed no violations of assumptions. The maximum value for the Variance Inflation Factor (VIF) in the analysis was 2.17 indicating multicollinearity was not a problem. The maximum values of standardized residuals, Cook's distance and $DFBETA$ in this analysis were 2.69, .149 and .122, respectively, suggesting no case had high influence on the overall equation or any of the individual coefficients.

Analysis 8.15

To confirm that the results were not affected by the nonnormality of conscientiousness, the analysis was repeated using the transformed variable for $CONSC^+$. For completeness, the transformed variable JD^+ was also used. The results were not materially different. The significance of the three-way interaction term was $p = .034$. The increase of the squared partial correlation R^2 was .040, and the *adjusted* R^2 increased by .019. It is concluded that the nonnormality of conscientiousness did not materially influence the results.

Analysis 8.16

The computer approach suggested by Aiken and West (1991: 54) was again conducted to confirm the simple slope equations, and to conduct t -tests to confirm whether the slopes were significantly different to zero. The equations are:

$$\text{At } CONSC_H \text{ and } WLCS_H \quad \hat{Y} = -.687 \times OCCESFF + 27.812 \quad (\text{Equation 8.9})$$

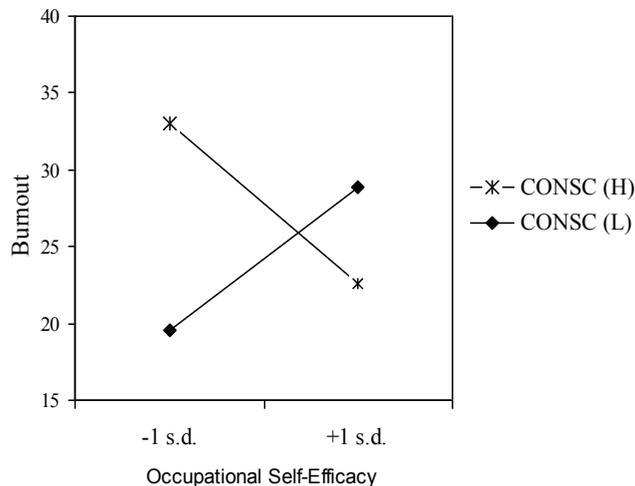
$$\text{At CONSC}_L \text{ and WLCS}_H \quad \hat{Y} = .600 \times \text{OCCEFF} + 24.253 \quad (\text{Equation 8.10})$$

$$\text{At CONSC}_H \text{ and WLCS}_L \quad \hat{Y} = -.474 \times \text{OCCEFF} + 29.896 \quad (\text{Equation 8.11})$$

$$\text{At CONSC}_L \text{ and WLCS}_L \quad \hat{Y} = -.212 \times \text{OCCEFF} + 36.862 \quad (\text{Equation 8.12})$$

The slopes were plotted for high and low conscientiousness, at values of high and low work locus of control (see figures 8.6 and 8.7, respectively), by substituting values of the variables one standard deviation above and below the mean into these four regression equations. In figure 8.6, the slope for CONSC_H was found to be significantly different from zero ($p = .002$). The slope for CONSC_L was found to be slightly above the significance ($p = .116$). With the controls of gender, tenure and demand removed, but neuroticism still included, the slope was found to be significant ($p = .088$).

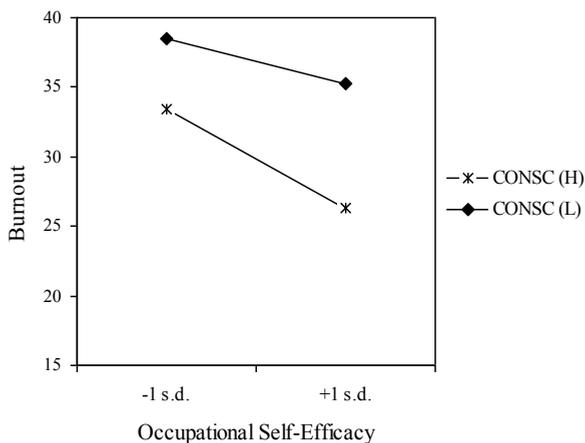
FIGURE 8.6 Interaction between Conscientiousness and Occupational Self-Efficacy for High Work Locus of Control predicting Burnout



In figure 8.7, the slope for CONSC_L was not found to be significantly different from zero ($p = .345$), but the slope for CONSC_H was on the border of significance ($p = .100$). The slopes are very similar to those found for transformed emotional exhaustion as the dependent variable (see figures 8.3 and 8.4). Two noticeable differences were: firstly, the slope for low conscientiousness and high work locus of control had a higher level of significance ($p = .088$, compared to $p = .134$, previously, both without the controls included in the regression equations); and secondly, the slope of high conscientiousness and low work locus of control was downward-sloping rather than horizontal (slopes of $-.474$, $p = .100$, compared to $.007$, $p = .790$ previously). The first result confirms that when work locus of control is high, and conscientiousness is low the level of burnout will increase as occupational efficacy increases. The second result

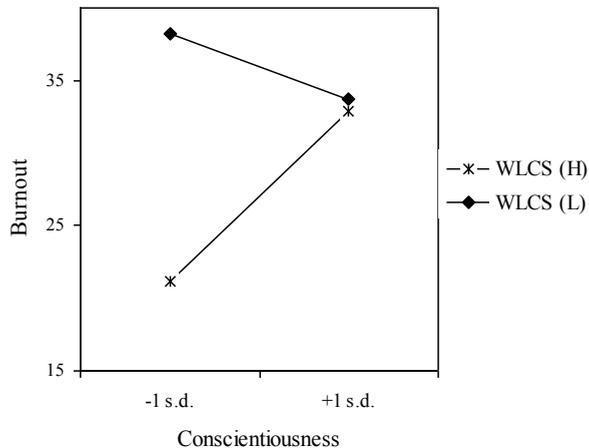
indicates that for the case of burnout, an increase in occupational self-efficacy will result in a decline in burnout when conscientiousness is high, even when work locus of control is low.

FIGURE 8.7 Interaction between Conscientiousness and Occupational Self-Efficacy for Low Work Locus of Control predicting Burnout



To confirm the result that high work locus of control results in an increase in burnout when occupational self-efficacy is low, and conscientiousness increases, the equations for the regression of burnout on conscientiousness were examined at values of work locus of control and occupational self-efficacy, minus the conditional values of CV_Z and CV_W , corresponding to conditional values at ± 1.0 standard deviation. The plot for the case of low occupational self-efficacy is shown in figure 8.8. The slope for $WLCS_H$ was found to be significant ($p = .017$), while the slope for $WLCS_L$ was found to be nonsignificant ($p = .150$). As can be seen from the plot, it is clearly shown that as conscientiousness increases, when occupational self-efficacy is low and work locus of control is high, the level of burnout increases significantly. When occupational self-efficacy is high and work locus of control is low, an increase in conscientiousness results in a decrease in burnout, although it must be noted that this slope was found to be nonsignificant ($p = .150$).

FIGURE 8.8 Interaction between Conscientiousness and Work Locus of Control for Low Occupational Self-Efficacy predicting Burnout



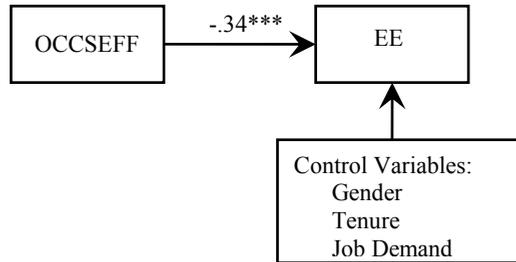
8.4 DISCUSSION

8.4.1 Occupational Self-Efficacy, Personality and Burnout

The prime objective of this chapter was to determine the relationship between occupational self-efficacy and individual well-being. Occupational self-efficacy was found to be negatively related to emotional exhaustion and reduced personal accomplishment with a moderate effect size, and to the unidimensional measure of burnout with a large effect size (increases in the squared partial correlation R^2 of .132, .159 and .236, respectively). Although occupational self-efficacy was not found to be significantly related to depersonalization in the linear regression analysis, the logistic regression analysis did indicate that the higher the value of occupational self-efficacy, the less likely it is that the individual will report experiencing depersonalization. The results are summarized in figures 8.9, 8.10 and 8.11.

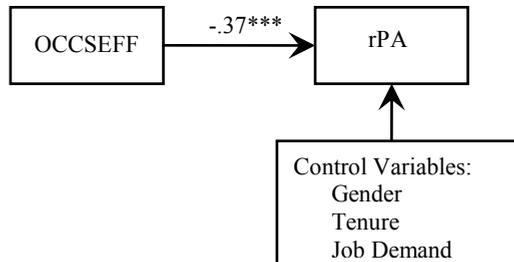
When the unidimensional measure of burnout was regressed onto the three personality trait variables and occupational self-efficacy, while controlling for gender, tenure and job demand, neuroticism, work locus of control and occupational self-efficacy were found to significantly predict emotional exhaustion, while conscientiousness was found to be nonsignificant. The standardized coefficients for the three variables neuroticism, work locus of control and occupational self-efficacy indicate their relative importance in the prediction of burnout ($\beta = .276, p = .001, \beta = -.304, p = .000$ and $\beta = -.217, p = .013$, respectively).

FIGURE 8.9 Relationship between Occupational Self-Efficacy and Emotional Exhaustion



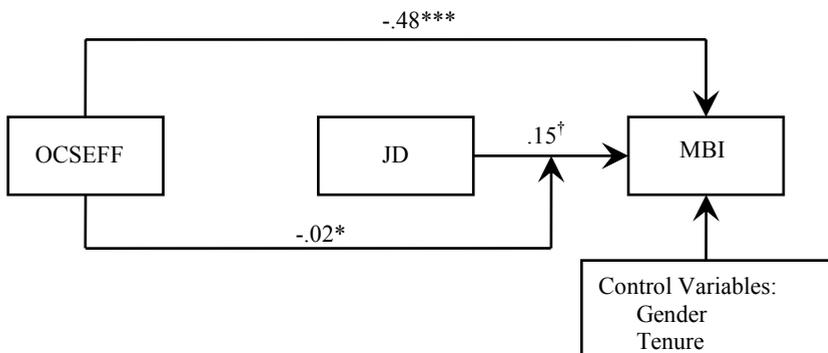
Notes: Standardized coefficient is shown.
 $^{\dagger} p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

FIGURE 8.10 Relationship between Occupational Self-Efficacy and reduced Personal Accomplishment



Notes: Standardized coefficient is shown.
 $^{\dagger} p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

FIGURE 8.11 Relationships between Occupational Self-Efficacy, Job Demand and Burnout



Notes: Standardized coefficients are shown, except for the interaction term where the unstandardized coefficient is shown.

$^{\dagger} p < .1$; $* p < .05$; $** p < .01$; and $*** p < .001$.

Although occupational self-efficacy was not found to significantly predict emotional exhaustion when the effects of the three personality traits were partialled out, it was found to be the most important predictor of reduced personal accomplishment, where only work locus of control and occupational self-efficacy were found to be significant in their prediction ($\beta = -.208, p = .026$ and $\beta = -.281, p = .007$, respectively). This does provide support for the argument of Lee and Ashforth (1990), Cordes and Dougherty (1993) and Wright and Bonett (1997) that personal accomplishment can be considered at a theoretical level to be similar to self-efficacy.

Although there have been few empirical tests of the role of self-efficacy as a moderator of the stress-strain relationship, and although results have been found to be mixed (Jex et al., 2001), occupational self-efficacy was found to significantly interact in the prediction of the unidimensional measure of burnout. This finding is consistent with those of van Yperen and Snijders (2000), who found that self-efficacy moderated the relationship between job demands and psychological health, of Jex and Bliese (1999), that self-efficacy moderated the relationship between work overload and psychological strain, and of Schaubroeck and Merritt (1997), who found that self-efficacy moderated the role between job demands and stress. For the moderation of the relationship between job demand and emotional exhaustion, only partial support was found. Although not shown, the coefficient for the unstandardized product term was $B = -.012, p = .071$, when the untransformed emotional exhaustion variable was used as the dependent variable, but was nonsignificant ($p = .194$) when the transformed variable emotional exhaustion was included as the dependent variable. In addition, the increase in the adjusted R^2 was only .018 when the untransformed term was used as the dependent variable, which is below the lower limit for acceptance suggested by Cohen et al., (2003).

A further aim of this chapter was to investigate whether self-efficacy and personality interact to facilitate well-being, as suggested by Walsh (2004: 152), and whether the personality trait of conscientiousness is a distal motivational force which acts through more proximal motivation variables such as goals, self-efficacy and expectancies, as suggested by Barrick and Mount (2005). The three-way interaction between work locus of control, conscientiousness and occupational self-efficacy was found to significantly predict both emotional exhaustion and burnout. As measures of stress are highly correlated with neuroticism, and individuals high in neuroticism are likely to report high levels of stress and probably high levels of burnout (Watson & Pennebaker, 1989), the interaction was also retested while controlling for neuroticism, it was again found to significantly predict both emotional exhaustion and burnout.

Probing of the three-way interactions using the methods suggested by Aiken and West (1991) allowed generation of the simple slopes for the interactions and significance testing of the slopes. As expected, the trends of the slopes between the plots for emotional exhaustion and burnout were consistent. This provides further support for

consideration of emotional exhaustion as being the central component for the understanding of the process leading to the development of burnout (Cordes & Dougherty, 1993; Cropanzano et al., 2003). For emotional exhaustion, the plots confirmed that an increase in occupational self-efficacy only predicted a reduction in emotional exhaustion when work locus of control was high and conscientiousness was high. For burnout, a reduction was predicted for an increase in occupational self-efficacy whether work locus of control was high or low, although the reduction was greater for the case of high work locus of control. Of particular interest are the plots shown in figures 8.7 and 8.14. In both of these plots, it is indicated that when occupational self-efficacy is low, then an increase in conscientiousness does not result in a reduction for both emotional exhaustion and burnout when work locus of control is low. For the case of high work locus of control, an increase in conscientiousness results in an increase in both emotional exhaustion and burnout. The upward slopes for high work locus of control and low occupational self-efficacy was found to be significant for both emotional exhaustion and burnout ($p = .072$ and $p = .017$, respectively).

From a first examination of this finding, it is hard to understand how an increase in work locus of control can be associated with an increase in emotional exhaustion and burnout, as prior research (including this study) has consistently demonstrated that external individuals (those with a low level of work locus of control) are more vulnerable and suffer higher levels of stress (see, for example, James & Wright, 1993; Spector, 1986) and internal individuals are expected to be more resilient and deal better with failure than externals (Lefcourt, 1976). However, the results can be explained from consideration of the traits and behaviours associated with high and low conscientiousness in conjunction with the findings of Schaubroeck and Merritt (1997) and Fusilier et al. (1987). Schaubroeck and Merritt (1997) found that self-efficacy was determinant of the form of interaction between job demands and control in the prediction of cardiovascular effects. This led Schaubroeck and Merritt (1997) to suggest that when people are confident in their abilities, a high level of control mitigated the stress consequences of demand. However, when self-efficacy was low, high demands and high control had negative health consequences. The findings of Fusilier et al. (1987) suggested that an internal locus of control may be useful in responding to stress only when resources are available. Moreover, they posited that internals will feel compelled to cope, and will become frustrated and strained if they do not have the internal resources to do so. As conscientiousness is associated with achievement striving (Costa & McCrae, 1991), and individuals high in conscientiousness tend to be ambitious and achievement-orientated (Barrick & Mount, 1993) while individuals low in conscientiousness tend to be easy-going, negligent, disorganized, lazy and aimless (Barrick & Mount, 2004), it may be that as the level of conscientiousness increases, internals become more compelled to cope. If they have a low level of occupational self-efficacy they will judge that they have inadequate internal resources to do so, and so

will become frustrated and stressed. It may be that as conscientiousness increases, individuals will put themselves under increased demands. Then consistent with the findings of Schaubroeck and Merritt (1997) when self-efficacy is low, high demands and high control will have negative health consequences and will result in increased levels of emotional exhaustion and burnout.

8.4.2 Conclusions

The results of this chapter indicate that occupational self-efficacy is negatively associated with burnout and each of its three components. It is most strongly associated with the component of reduced personal accomplishment, where it was the most significant predictor when the three personality traits were included in the model. Occupational self-efficacy was found to moderate the relationship between job demands and burnout, and the three-way interaction between work locus of control, occupational self-efficacy and conscientiousness was found to significantly predict both emotional exhaustion and burnout. The findings provide support for Bandura's (1995) contention that self-efficacy is conducive to individual well-being, and for Barrick and Mount's (2005) observation that personality may be a distal motivational force which acts through more proximal motivation variables such as goals, self-efficacy and expectancies.

CHAPTER 9

CONCLUSIONS

9.1 GENERAL CONCLUSIONS

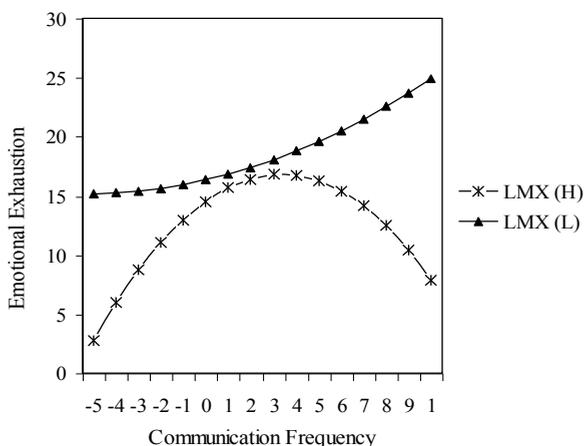
The central aim of this research was to investigate the impact of an individual's personality and their relationship with their manager on the two personal outcomes of burnout and occupational self-efficacy. A further objective was to determine the relative importance of each of the factors and to investigate the interactions between the variables considered through the generation and testing of a number of hypotheses relating to a number of moderation and mediation effects.

LMX was found to be negatively related to the unidimensional measure of burnout and to each of the three components - emotional exhaustion, depersonalization and reduced personal accomplishment. This is consistent with the two studies of LMX and burnout known to the author at the time of writing this dissertation of Thomas (2005) and Bakker et al. (2005). Communication frequency was found to be related to both emotional exhaustion and the unidimensional measure of burnout with a curvilinear, predominantly positive, but concave downward-sloping relationship. For depersonalization a positive linear relationship was indicated, while for reduced personal accomplishment no significant relationship was supported. The relationships were only found to be significant when LMX was controlled for. These results were not as predicted and are not consistent with the prior research of Pfennig and Husch (1994; cited in Schaufeli & Enzmann, 1998: 83) which indicated a negative linear relationship between feedback and all three dimensions of burnout, but is consistent with that of Leiter and Maslach (1988) who found that reduced personal accomplishment was not affected by either pleasant or unpleasant supervisor contact. While LMX theory suggests that intra-dyadic communication is essential for the development of high-quality LMX relationships and communication is the vehicle through which leaders and followers nurture and maintain their relationships (Graen & Uhl-Bien, 1995), significant prior research has shown that high- and low-quality LMX relationships are characterized by different qualities and types of communication (see, for example, Dienesch & Liden, 1986; Fairhurst, 1993; Fairhurst & Chandler, 1989; Fairhurst et al., 1987; Graen & Uhl-Bien, 1995; Mueller & Lee, 2002). This appears to be an important factor in understanding the results for the relationships between communication frequency and burnout in this study. A significant interaction was found between LMX and communication frequency in the prediction of emotional exhaustion (see the replication of figure 4.11). The interaction was still significant when conscientiousness, neuroticism and work locus of control were controlled for.

As expected, individuals in low-quality LMX relationships were found to experience higher levels of emotional exhaustion at all levels of communication frequency than those in high-quality LMX relationships. For the case of low-quality LMX the curve is predominantly positive with an increasingly steep upward slope. This

can be explained by consideration of the following prior research. In low-quality exchanges supervisors have been found to be more likely to use dominance (Fairhurst et al., 1987) and positional power and authority (Fairhurst & Chandler, 1989) when communicating with employees. Communication in low-quality exchanges has been found to be more likely to be antagonistic and adversarial (Fairhurst, 1993). Moreover, low-quality LMX relationships are characterized by low trust (Graen & Uhl-Bien, 1995) and prior research has found a negative relationship between trust and the use of negative influencing tactics such as assertiveness (face to face confrontations, use of anger to try and force compliance) and upward appeal (coalition forming at hierarchical level above the target of influence) (Ringer & Boss, 2000).

FIGURE 4.11 (Replicated) Interaction between Communication Frequency and LMX Predicting Emotional Exhaustion (EE); (for regression of Emotional Exhaustion on Communication Frequency)



A direct negative relationship between LMX quality and the use of upward influencing tactics such as assertiveness has also been found (Deluga & Perry, 1991). It follows that in low-quality LMX relationships communication with the manager will be emotionally demanding and will consume an individual's internal resources. The increasing upward slope can be explained by the importance of contact frequency in influencing individual's attitudes and views (see, for example, Redman & Snape, 2002) and prior research which has shown the impact of frequency of interaction for the importance of LMX on outcomes (Kacmar et al., 2004). The upward slope can also be explained by the findings of van Dierendonck et al. (2004) who found that as employees became more stressed they became more negative, which resulted in a decrease of supportive behaviour by their manager. This finding is consistent with that of Leiter and Maslach (1988), who, in a study of nurses and support staff and their supervisors in a

hospital, found that unpleasant contact with the supervisor was an important source of interpersonal stress and played a role in the development of emotional exhaustion.

The curve for the case of high-quality LMX starts with a steep upward slope and once it reaches a maximum value has a downward slope from there on. This can be interpreted as employees in high-quality LMX relationships experiencing an initial increasing level of emotional exhaustion and then a decreasing level. Albrecht and Adelman (1984c) identify that a fundamental requirement for well-being is that of supportive communication. In contrast to low-quality LMX exchanges, in high-quality exchanges supervisors tend to adopt a more positive tone (Dienesch & Liden, 1986), use communication behaviours which reinforce affect and relationship building (Fairhurst, 1993) and feature less dominance (Fairhurst et al., 1987). Employees in high-quality exchanges receive more information (van Dam et al., 2008), are more satisfied with the communication with their manager (Meuller & Lee, 2002) and report higher levels of satisfaction with their manager (Greguras & Ford, 2006; Schyns & Croon, 2006). High-quality exchanges are characterized by loyalty and mutual affection (Dienesch & Liden, 1986; Liden & Maslyn, 1998; Maslyn & Uhl-Bien, 2001) and when faced with difficult situations employees in high-quality LMX relationships can rely on their manager for emotional support (Dienesch & Liden, 1986; Graen & Uhl-Bien, 1995; Sparrowe & Liden, 1997). Thus, the portion of the downward sloping curve can be explained by the provision, by the manager, of high levels of useful information and support for the individual.

The upward sloping portion of the high-quality LMX curve is interesting, and contrary to the large body of prior research that indicates high-quality LMX is associated with positive benefits for employees (Harris & Kacmar, 2006). Individuals in high-quality LMX relationships have a high level of respect (Graen & Uhl-Bien, 1995) and loyalty towards their manager (Dienesch & Liden, 1986) and are likely to feel high levels of obligation (Graen & Uhl-Bien, 1995). Prior research has found that the communication of high expectations to employees (intellectual stimulation) led to higher levels of burnout (Seltzer et al., 1989) and detrimental effects for followers (Podsakoff et al., 1990; Podsakoff et al., 1996). Also, a leadership style which only provides attention when standards are not met (management by exception) has been found to lead to increased levels of burnout (Seltzer et al., 1989). Moreover, Wright and Cropanzano (1998) suggest that an employee who receives negative performance feedback may be more likely to experience emotional exhaustion than a person who receives positive feedback. Therefore, possible explanations for the upward sloping portion of the curve at low communication frequency relate to individuals experiencing management by exception, possibly associated with a predominance of negative feedback, and individuals feeling a high level of obligation to meet high expectations and the need to find new ways to do things communicated by their manager resulting in them putting more effort in to the tasks required and possibly working more hours.

A further possible explanation for the initial upward sloping curve for high-quality LMX relates to the issues of uncertainty concerning interactions with their manager and of impression and identity management. Even when an employee's relationships with their manager is positive, due to the power inherent in the manager's role interactions may have risks for individuals (Ray, 1987). While there can be benefits from interactions with their manager, individuals can incur relational costs through having to engage in impression or identity management (Albrecht & Adelman, 1987c). It may also be that the interaction itself may be uncertain and even when there is a slight concern that the manager's behaviour will be negative, the individual may become stressed about the interaction itself (Albrecht & Adelman, 1987c). It seems reasonable to assume that issues of uncertainty and impression and identity management would be prevalent when communication frequency is low and when the relationship between the individual and their manager is valued by the individual.

These findings are consistent with the results of van Dierendonck et al. (2004) that leaders play an important role in influencing employee well-being and support the statement that "poor supervisor-subordinate relationships characterized by low supervisor supportiveness, low quality of communication, and lack of feedback reduce individual well-being and contribute substantially to feelings of stress" (van Dierendonck et al., 2004: 165). The findings do not provide support for the conventional wisdom that more open communication is associated with more positive outcomes for the individual (Kramer, 2004) and for both the low- and high-quality LMX cases provide support for Kramer's (2004) speculation that more communication is not always better for an employee. Similar to the findings of Kramer et al. (2004), little support was found for the uncertainty reduction theorem.

LMX was found to be positively related to occupational self-efficacy. This is consistent with prior research of LMX and self-efficacy (Murphy & Ensher, 1999) and LMX and occupational self-efficacy (Schyns & von Collani, 2002; Schyns et al., 2005). Interestingly, the correlation between LMX and occupational self-efficacy in this study was higher than that found in the studies by Schyns and von Collani (2002) and Schyns et al. (2005). This may be explained by consideration of Bandura's (1986) suggestion that when individuals experience performance ambiguity, through not being able to monitor their own performance or when levels of accomplishment are socially judged or ill-defined, individuals have to place a greater reliance on others to determine how they are doing and this will impact on their self-efficacy judgments. As the performance statistics for the respondents in this study are not available to them until fourteen months after the time to which they relate (see section 3.2.7) it is likely that the respondents experienced higher levels of performance ambiguity than the shop floor workers in the studies of Schyns and von Collani (2002) and Schyns et al. (2005) and this influenced the higher correlation values found.

Communication frequency was found to be positively related to occupational self-efficacy and is consistent with prior research by Parker (1998). LMX was found to fully

mediate the relationship between communication frequency and occupational self-efficacy. As high-quality LMX relationships are characterized by more positive communication than low-quality relationships (Dienesch & Liden, 1986), the findings of this study support Parker's (1998: 843) speculation that "the quality of communication might be a more important determinant of self-efficacy than simply the quantity." As mutual respect, and respect for the capabilities of the other are key dimensions of LMX (Graen & Uhl-Bien, 1995) and high-LMX relationships are characterized by high-levels of trust (Graen & Uhl-Bien, 1995) these findings also support Bandura's (1976; 1986) assertion of the critical role played by the credibility, trustworthiness and respect for the expertise of the individual involved in the social persuasion.

Neuroticism was found to be positively related to burnout and its components, (although support for a significant relationship with depersonalization was limited), while conscientiousness and work locus of control were found to be negatively related. The three traits explained an additional 36.6% of variance over that explained by gender, tenure and job demand for the unidimensional measure of burnout. For each of the components the additional variance explained by the three personality traits over that explained by gender, tenure and job demand was 31.7% for emotional exhaustion, 10.5% for depersonalization and 13.3% for reduced personal accomplishment. Neuroticism was found to be the most important trait for emotional exhaustion, while work locus of control was found to be the most important trait for depersonalization and reduced personal accomplishment. Work locus of control and neuroticism were found to have similar, but opposite effects on the unidimensional measure of burnout (standardized coefficients $\beta = -.37, p < .001$ and $\beta = .34, p < .001$, respectively).

As expected from the job demands-resources model of burnout (Demerouti et al., 2001; Schaufeli & Bakker, 2004), which predicts that job demands are primarily and negatively related to emotional exhaustion (Bakker et al., 2004) and extensive prior research (see, for example, Cordes & Dougherty, 1993; Lee & Ashforth, 1996; Demerouti et al., 2001; Schaufeli & Bakker, 2004; Bakker et al., 2005), job demand was found to be related to emotional exhaustion, but not to depersonalization or reduced personal accomplishment. Job demand was also found to be positively related to the unidimensional measure of burnout.

Significant interactions were found for work locus of control and job demand in the prediction of emotional exhaustion, and for conscientiousness and neuroticism in the prediction of the unidimensional measure of burnout. When work locus of control was external (low), as job demand increased the level of emotional exhaustion was found to increase, whereas for the case of internal (high) work locus of control, an increase in job demand did not result in an increase in emotional exhaustion. An increase in job demand was found to be associated with an increase in burnout for the case of low conscientiousness, but not for the case of high conscientiousness. Similarly, an increase in job demand was found to be associated with an increase in burnout for the case of high neuroticism, but not for the case of low neuroticism. These results provide support

for the use of Lazarus and Folkman's (1984) cognitive appraisal model of stress in the study of burnout, and support the importance of individual differences in motivation and cognition on perceptions of environmental demands and outcomes, as well as on the coping styles adopted. Job demand was also found to significantly predict LMX with a positive relationship, but only when the three personality variables – conscientiousness, neuroticism and work locus of control were controlled for. This finding is consistent with the prior research of Kinicki and Vecchio (1994) which suggested that the level of demand faced by managers was positively related to LMX quality. Their findings led them to suggest that “when under pressure, leaders and members can develop stronger working relationships” (Kinicki & Vecchio, 1994: 80). As in this study the relationship was only significant when the three traits were controlled for, the importance of personality on the perceptions of job demand is again indicated. These findings again provide strong support that each of the personality traits of conscientiousness, neuroticism and work locus of control are important antecedent factors in the development of burnout.

All three traits were found to significantly predict occupational self-efficacy and the additional variance explained was 30.9%. As predicted, conscientiousness and work locus of control were found to be positively related and neuroticism was found to be negatively related. Again, neuroticism and work locus of control were found to have similar but opposite effects with conscientiousness found to have a slightly lower effect size.

A three-way interaction between the personality traits was found to significantly predict occupational self-efficacy. As expected the maximum value for occupational self-efficacy was predicted when neuroticism was low, and both conscientiousness and work locus of control were high. When neuroticism was low an increase in occupational self-efficacy was only predicted for an increase in work locus of control internality when conscientiousness was high and was predicted to decline when conscientiousness was low. The maximum decrease in occupational self-efficacy was predicted when neuroticism increased and both conscientiousness and work locus of control were low. An unexpected finding was that when neuroticism was high an increase in occupational self-efficacy was predicted for the case of low conscientiousness but not high conscientiousness when work locus of control internality increased although this was from the lowest initial level (see section 5.4.3 for a discussion of these findings). These results provide strong support for Gist and Mitchell's (1992) posited process of self-efficacy formulation and in particular, for the importance of an individual's attributional analysis of their prior experiences and the central importance of the assessment of the self for an individual's self-efficacy development.

A prime objective of this study was to investigate whether personality or leadership was more important in the development of burnout and occupational self-efficacy. The results suggest that personality is more important than leadership, for both burnout and occupational self-efficacy, except for the case of the case of depersonalization where

LMX was found to be the most important predictor. This result is consistent with the predictions of the job demands-resource model (Demerouti et al., 2001; Schaufeli & Bakker, 2004) which defines job resources as the physical, psychological, social or organizational aspects of a job that contribute to the achievement of work-related goals, reduce job demands or the costs associated with them, and stimulate personal growth and development (Demerouti et al., 2001) and predicts that job resources will be primarily and negatively associated with depersonalization.

The three personality traits explained an additional 31.9% of variance for burnout and 26.5% for occupational self-efficacy, while LMX and communication frequency explained an additional 7.6% for burnout and did not significantly predict occupational self-efficacy when the effects of the three personality traits were partialled out. For emotional exhaustion, neuroticism was found to be the most important predictor. The three personality factors explained an additional 26.3% of variance of emotional exhaustion, while LMX and communication frequency explained an additional 9.8%. As emotional exhaustion is considered to be the central variable in terms of understanding the burnout process (Cordes & Dougherty, 1993; Cropanzano et al., 2003) this again emphasizes the important role of personality in the etiology of burnout.

Work locus of control was found to be the second highest predictor of both emotional exhaustion and depersonalization and was found to be the only significant predictor of reduced personal accomplishment when the other variables were controlled for. Overall, it was found to have the largest effect size of all of the variables on the unidimensional measure of burnout. In conjunction with the previously mentioned findings of the relative importance of work locus of control for occupational self-efficacy the assertion of Ng et al. (2006) that locus of control provides at least, if not greater predictive power for work outcomes as the Big-Five personality traits is supported.

Although the results are not shown in this dissertation, the recommendation of Daniels and Guppy (1992) was followed (see section 3.2.6). The unidimensional of the WLCS scale was used as a measure of generalized perceived work control and the two-dimensional structure of *external agents* control and *personal* control was also considered. The findings did not indicate a loss of specificity or precision through the use of the unidimensional measure and with the exception of a marginal improvement in the significance of the interaction with job demand in the prediction of burnout for the measure of *personal* control, were not materially different.

Although it is suggested that LMX is less important than the personality factors considered, particularly of neuroticism and work locus of control, it must be noted that the three personality traits were found to be significantly related to LMX and LMX was found to mediate the relationships between each of the personality variables and burnout and its components, and occupational self-efficacy. The three personality variables explained an additional 18.0% of the variance of LMX. Conscientiousness was found to be the most important trait, and was related to LMX with a curvilinear relationship with

a predominantly positive, concave, and downward-slope. Work locus of control was also positively related to LMX, while neuroticism was found to be negatively related.

For communication frequency the results were not as hypothesized, except in the case of work locus of control which was positively related to communication frequency and was fully mediated by the quality of the LMX relationship. Neuroticism was not found to significantly predict communication frequency, whilst conscientiousness was found to significantly predict communication frequency, but only when LMX quality was controlled for. The relationship between communication frequency and conscientiousness was found to be negative and there was some evidence of a moderation effect by LMX. The results suggested that in high-quality LMX relationships the level of communication frequency decreases as the level of employee conscientiousness increases, while in low-quality LMX relationships it did not. This is thought to be explained by managers judging a lower need to communicate with individuals in whom they have higher levels of trust and judge to be competent.

It is expected that the environmental conditions in this study were relatively weak compared with many other organizational contexts as the respondents had a high degree of autonomy and the workplace was characterized by high levels of political behaviour. It should also be noted that many of the resources available to the respondents were from central government or other government agencies rather than their line manager. As trait-performance relationships tend to be strongest when situational cues are weak (Stewart & Barrick, 2004), employee autonomy is high (Barrick & Mount, 1993) and normative guidelines for behaviour are absent (Howachter et al., 2000) it may be that these factors have increased the relative importance of the three personality factors and reduced the importance of LMX on the development of burnout in this study.

Although occupational self-efficacy was considered as a dependent variable in most of the analyses in the study, due to the observations of authors such as Bandura (1995), Jex et al. (2001) and Maddux and Lewis (1995) of the importance of self-efficacy for well-being, the relationships between occupational self-efficacy and burnout and its components were also investigated. Occupational self-efficacy was found to be negatively related to emotional exhaustion and reduced personal accomplishment with a moderate effect size, and to the unidimensional measure of burnout with a large effect size. Although occupational self-efficacy was not found to be significantly related to depersonalization in the linear regression analysis, the logistic regression analysis did indicate that the higher the value of occupational self-efficacy, the less likely it is that the individual will report experiencing depersonalization. When the unidimensional measure of burnout was regressed onto the three personality trait variables and occupational self-efficacy, while controlling for gender, tenure and job demand, neuroticism, work locus of control and occupational self-efficacy were found to significantly predict burnout, while conscientiousness was found to be nonsignificant. The standardized coefficients for the three variables neuroticism, work locus of control and occupational self-efficacy indicate their relative importance in the prediction of

burnout ($\beta = .276, p = .001, \beta = -.304, p = .000$ and $\beta = -.217, p = .013$, respectively). Occupational self-efficacy was not found to significantly predict emotional exhaustion when the effects of the three personality traits were partialled out, but was found to be the most important predictor of reduced personal accomplishment, where only work locus of control and occupational self-efficacy were found to be significant in their prediction ($\beta = -.208, p = .026$ and $\beta = -.281, p = .007$, respectively). This provides support for the argument of Lee and Ashforth (1990), Cordes and Dougherty (1993) and Wright and Bonett (1997) that personal accomplishment can be considered at a theoretical level to be similar to self-efficacy.

Occupational self-efficacy was also found to significantly interact with job demand in the prediction of the unidimensional measure of burnout. This finding is consistent with those of van Yperen and Snijders (2000), who found that self-efficacy moderated the relationship between job demands and psychological health, of Jex and Bliese (1999), that self-efficacy moderated the relationship between work overload and psychological strain, and of Schaubroeck and Merritt (1997), who found that self-efficacy moderated the role between job demands and stress.

The three-way interaction between work locus of control, conscientiousness and occupational self-efficacy was found to significantly predict both emotional exhaustion and burnout. As expected an increase in occupational self-efficacy predicted a decrease in emotional exhaustion when conscientiousness and work locus of control were high. Probing of the three-way interactions using the methods suggested by Aiken and West (1991) allowed generation of the simple slopes for the interactions and significance testing of the slopes. When occupational self-efficacy was low an increase in conscientiousness did not significantly predict a reduction in emotional exhaustion when work locus of control was external. Interestingly, when occupational self-efficacy was low an increase in conscientiousness significantly predicted an increase in emotional exhaustion when work locus of control was internal. This result is consistent with the findings of Fusilier et al. (1987) which suggested that an internal locus of control may be useful in responding to stress only when adequate resources are available. As conscientiousness is associated with achievement striving (Costa & McCrae, 1991) it may be that as suggested by Fusilier et al. (1987) as internals feel compelled to cope they will become frustrated and strained if they do not have the internal resources to do so. The trends of the slopes for emotional exhaustion and burnout were consistent which provides support for consideration of emotional exhaustion as being the central component for the understanding of the process leading to the development of burnout (Cordes & Dougherty, 1993; Cropanzano et al., 2003).

These aims and objectives of the study have been met and the study provides a number of contributions to the understanding of the impacts of LMX, communication frequency, and the personality traits of conscientiousness, neuroticism and work locus of control on the development of burnout and occupational self-efficacy and how these variables interact to influence employee well-being. Firstly, as the study of leadership

and burnout has been limited (Halbesleben & Bowler, 2007; Hetland et al., 2007; Seltzer & Numerof, 1988) this research provides a useful addition to this field. In particular, an additional study to the ones provided by Bakker et al. (2005) and Thomas (2005) of the impact of LMX on burnout is provided in a different field-setting. Secondly, as there are only a few studies available on feedback and burnout (Schaufeli & Enzmann, 1998) this study provides an additional study and extends the previous research by examining the interaction between LMX and communication frequency in the prediction of burnout. The study meets the call of Kramer (2004) for more research into whether the assumption that more communication between an employee and their manager is always better for an employee, it demonstrates the possibility of negative outcomes for employees in high-quality LMX relationships as called for by Harris and Kacmar (2006) and extends the work of Kacmar et al. (2004) to demonstrate the importance of the frequency of interaction for the impact of LMX on a previously unexamined outcome of burnout. Thirdly, the study meets the call of Conger and Kanungo (1988) for more research into empowerment and leadership, and provides an investigation of the relationship between LMX and occupational self-efficacy in a field-setting. The study also includes an examination of the impact of communication frequency on occupational self-efficacy and investigates the interactions between LMX and communication frequency for the development of occupational self-efficacy.

Fourthly, as little attention has been paid to the impact of personality traits on burnout (Bakker et al., 2006), a further contribution of this study is that it responds to the call of Zellars et al., (2000) for further investigation into personality factors as antecedents to burnout. It also responds to the call of Buunk and Schaufeli (1993) for further investigation into the moderating role of personality characteristics and provides evidence which suggests that it is the perception of job demands and coping styles adopted by an individual rather than the actual demand that influences the development of burnout. Fifthly, as prior research into the relationships between personality and self-efficacy is limited (Walsh, 2004) the study also provides a useful exploratory investigation in this area. An interesting contribution is that support is provided for Gist and Mitchell's (1992) argument that efficacy perceptions are influenced by differences in personality and for their theoretical analysis of the determinates and malleability of self-efficacy. Also, the study includes traits from the Big-Five with work locus of control and investigates their relative importance to both burnout and occupational self-efficacy.

Sixthly, the study provides an examination of the three personality traits of conscientiousness, neuroticism and work locus of control as antecedents of LMX as called for by Gerstner and Day (1997) and Martin et al. (2005). The work of Martin et al. (2005) is extended in that an additional field study of the role of LMX as a mediator of the relationship between work locus of control and different personal outcomes of burnout and its components and occupational self-efficacy is provided. A further contribution is that this analysis is repeated for two new personality traits of conscientiousness and neuroticism. This research combines the study of personality and

leadership in the development of burnout and occupational self-efficacy and allows a comparison of the relative effects and study of the interactions of these variables.

Finally, a further interesting contribution is the investigation of the relationship between occupational self-efficacy and burnout and its components and the examination of the three way interaction between occupational self-efficacy, conscientiousness and work locus of control in the prediction of burnout and emotional exhaustion. The three-way interaction extends the study of occupational self-efficacy and well-being and provides support for Walsh's (2004) suggestion that personality and self-efficacy may interact to facilitate well-being. It also provides support for the observation of Barrick and Mount (2005) that personality is a distal motivational force that will influence behaviour through proximal performance motivation variables such as goals, self-efficacy and expectancies and the recommendation of Erez and Judge (2001) that a single personality trait is often a poor predictor of performance and personality traits should not be tested in isolation.

Overall the results indicate that personality, leadership and communication frequency are important factors for the etiology of burnout and occupational self-efficacy. The results support the assertion of van Dierendonck et al. (2004) and Buunk and Schaufeli (1993), that the social context of the work place is an important factor for employee well-being and the observations of Cordes et al. (1997) and Maslach (1993) that interpersonal interactions are a key factor in the burnout process. The findings indicate that as observed by Barrick and Mount (2005), personality does matter in the work place and plays a meaningful role in determining perceptions, beliefs, behaviours and outcomes. Support is provided for Bandura's (1995) assertion that self-efficacy is an important factor for individual well-being.

9.2 STRENGTHS AND LIMITATIONS

A strength of this study is that it was field-based, focusing on individuals working in a role with a similar job description and in similar but predominantly different organizations, responsible for strategy formulation and implementation to achieve a National Government target in their respective geographical areas. The expected advantage of this was that environmental noise would be reduced in the study. A further strength of the study is that the response rate of the relatively small population was high (74.3%).

The use of domain-specific constructs for work locus of control and occupational self-efficacy in combination with the use of the national statistics of performance as a proxy for job demand are also considered as strengths. Great care was taken to confirm that the assumptions of linear regression analysis were not violated through the use of nonlinear transformations for both dependent and independent variables. The recommendation of Hair et al. (2006: 236) was followed, and regression analyses were conducted for both the original and transformed variables to assess the consequence of nonnormality of variables on the results. Appropriate methods were used for the

minimization of multicollinearity and the detection of influence by potential outliers on the results. The adoption of the two additional methods for testing mediation: the Sobel test and the calculation of the confidence limits for the significance of the indirect effects, assured the accuracy of the reported results. The curvilinear relationships, interactions and three-way effects found were confirmed as robust by testing them with a number of potential outliers removed, and controlling for the effects of the other variables in the study. For example, the three-way interaction between work locus of control, occupational self-efficacy and conscientiousness was still found to predict emotional exhaustion and the unidimensional measure of burnout when neuroticism was controlled for.

However, despite these strengths, as with any research, the present study does have some limitations which need to be noted. Although as mentioned above, the proxy used for job demand was obtained from published statistics, self-report measures were used for the other variables considered. This means that common-method variance (Podsakoff & Organ, 1986) may have influenced the results. Self-report measures were used as it would have been difficult to obtain data on individuals' personality, their perceptions of the quality of their LMX relationship with their manager, and their assessments of their levels of burnout and occupational self-efficacy from other sources. To minimize the influences of common-method variance, suggestions by Harrison et al. (1996), Lindell and Whitney (2001) and Podsakoff et al. (2003) on questionnaire design and procedural remedies for collection of the data were adopted (see section 3.4.1). Statistical investigation of each analysis did not indicate that common-method variance was a major problem, and the findings were consistent in many areas with previous results. It is also unlikely that common-method variance could account for the curvilinear relationships and interaction effects found in this study. The presence of common-method variance was also not indicated by the lack of non-hypothesized effects for other variables. Reliance is also placed on the suggestion by a number of authors that the problem of common-method variance may be overstated (Crompton & Wagner, 1994; Lindell & Whitney, 2001; Spector, 1994; Spector, 2006).

As the questionnaire was designed to be as short as possible, to reduce common-method variance problems (Lindell & Whitney, 2001) and to achieve a high response rate, a number of compromises were made. For example, social desirability was not measured. However, this is not considered as a major problem as findings by Moorman and Podsakoff (1992) indicated that social desirability effects do not seem to be widespread, and findings by Spector (1987) indicated that social desirability is usually not a source of bias in the measurement of work attitudes and perceptions. Further, prior research has found a lack of effect of social desirability on the MBI scale used to measure burnout and its components (Cordes & Dougherty, 1993; Maslach & Jackson, 1981) and on the WLCS scale used to measure work locus of control (Blau, 1993; Chung & Ding, 2002; Johnson et al., 1984; Spector, 1988). For the personality variables, social desirability has been found to be related to neuroticism and

conscientiousness (Ones et al., 1996). However, this led Ones et al. (1996) to conclude that scores of social desirability scales reflect individual differences in personality variables, and that as such partialing out social desirability scores is likely to remove some of the true variance from these measures of personality. The other control variables adopted in this study are somewhat limited, and could have been improved. The measure used for tenure was adopted from consideration of LMX theory. As previous research has indicated that LMX relationships are established within two months (Bauer & Green, 1996; Duchon et al., 1986), whether the individual had worked with their line manager for more than three months or not was measured. This control variable could have been improved by recording the period of tenure in months. Age has been found to be an important variable in burnout studies, with younger people consistently reporting higher levels of burnout than older people (Cordes & Dougherty, 1993). It would have been an improvement to have collected data on respondents' ages to control for this variable.

A possible limitation relates to the measure of depersonalization. While the MBI-Human Services Survey (MBI-HSS) (Maslach & Jackson, 1981) used in this study has been found to be very reliable (Lee & Ashforth, 1990) and was readily available, it must be noted that the depersonalization scores recorded were very low, with a high number of respondents recording a zero score. It may be that it would have been more beneficial to have used the MBI-General Survey (MBI-GS) (Schaufeli et al., 1996), to measure the level of the respondent cynicism rather than depersonalization. Although sound reasons influenced the decision to only include the traits of conscientiousness and neuroticism in this study (see section 2.5.3), it is a weakness of this study that the other three traits were not measured. The other factors have been found to be related to components of burnout (see, for example, Bakker et al., 2006; Piedmont, 1993; Deary et al., 2003), and extroversion and agreeableness could be expected to be important factors in the development of the quality of LMX relationships.

A further weakness of this study is that the manager is invisible, and their personality and perceptions of the quality of the LMX relationship were not measured. Prior research has found that perceptions of attitudinal similarity between leaders and followers are positively related to the quality of LMX (see, for example, Phillips & Bedeian, 1994; Engle & Lord, 1997). It would have been useful to have established the impact of the influence of the manager's personality on the quality of the LMX relationship. While LMX is an exchange theory of leadership that assumes that, over time, the relationship between the individual and their manager will reach an equilibrium state, with balanced reciprocity (Bower et al., 2000) and the dyadic relationship is the focus of analysis and LMX is defined as the measure of the quality of the exchange relationship, the theory appears to predict that the relationship has a reality of its own: that is there should be no difference between the individual's or the manager's or a third party's perception of the quality of the exchange. However, prior research has found that the correlation between LMX, measured from the member's

perspective, and the leader's perspective, is lower than might be expected (see, for example, Gerstner & Day, 1997; Greguras & Ford, 2006, correlations of $r = .29$ and $r = .40$, respectively). So it would have been useful to have measured the managers' perspectives of LMX quality as well, rather than only the individuals' perception when studying the individuals' personality traits as antecedent factors in the development of LMX quality, particularly as prior research has shown that an individuals' perceptions of leadership are influenced by their personality (Durand & Nord, 1976; Ehrhart & Klein, 2001; Schyns & Sanders, 2007).

The relatively small sample size ($n = 128$) in this study reduced the power of the analysis. As the likelihood of making type II errors (finding no significance) increases when the sample size is low, it may be that some of the effects may be underestimated in strength and that other weak effects were not detected. Of importance is that the low sample size does not threaten the validity of the effects and interactions found. While in some of the models interaction terms were found to be nonsignificant, it must be noted that it would be a misspecification of the regression model to omit these terms, as higher-order terms only represent the effects they are intended to when the lower-order terms are partialled out (Aiken & West, 1991; Cohen et al., 2003). That the interaction terms were only able to explain a limited amount of additional variance in the dependent variable is consistent with the results of other studies. Frazier, Tix and Baron (2004) note that effect sizes for interactions are usually small, with increases in the squared partial correlation R^2 of around .02. Champoux and Peters (1987: 243) argue that "the increment in the R^2 should be viewed as an incomplete measure of the strength of moderator effects." The interactions in this study are considered to be interesting from a theoretical perspective, providing important information of presence and complexity of the interactions between the variables in the development of burnout and occupational self-efficacy.

A further limitation is that the study was cross-sectional. While the personality traits have previously been found to be stable over time (John & Srivastava, 1999; Spector, 1988) and can be considered as antecedent factors, the direction of causality amongst the other variables must be approached cautiously and with due consideration of relevant theory. Finally, as this study was of a single set of respondents, it may not be generalizable to individuals in other organizational contexts.

9.3 RECOMMENDATIONS FOR FUTURE RESEARCH

A number of areas are suggested for future research. The first is that collection of data from other organizations would confirm the replicability of these findings in other contexts. This would allow determination of the relative importance of personality and LMX when environmental conditions are stronger or weaker and also where the employee is more dependent on their immediate manager for key resources. Whether the interaction between LMX and the curvilinear communication frequency-emotional exhaustion relationship can be replicated would be of interest and investigation of the

factors influencing the initial upward slope of the high-quality LMX curve would provide useful insights. Whether the three-way interaction between conscientiousness, work locus of control and occupational self-efficacy in the prediction of burnout and emotional exhaustion could be replicated would be of interest and further investigation under the conditions where an internal locus of control can result in negative outcomes for an individual.

The research could be usefully extended to include the other three Big-Five traits – agreeableness, openness to experience and extraversion. These may be important, in particular, as antecedent factors for the development of LMX quality and for occupational self-efficacy. Further to the three-way interactions found in this study and to extend the research into personality and burnout of interest is the concept of core self-evaluation (see, for example, Judge, Locke & Durham, 1997; Judge, van Vianen & De Pater, 2004). Core self-evaluation is indicated by the four personality traits of self-efficacy, locus of control, neuroticism and generalized self-esteem (Judge et al., 1997). While it is not contended that these traits are redundant (Judge, Erez, Bono & Thoresen, 2003) it is suggested that there are parts of each trait which are unique and important and that if the traits are considered in isolation under-prediction and semantic confusion may result (Judge, van Vianen & De Pater, 2004). Core self-evaluation is a higher-order concept which represents the fundamental evaluations that individuals make about themselves and their functioning in their environment (Judge, van Vianen & De Pater, 2004). Individuals with a positive core self-evaluation appraise themselves see themselves as capable, worthy and in control of their lives.

In this study a single measure was used for LMX. It would be interesting to investigate whether personality traits are antecedent factors for the development of the different dimensions of LMX of perceived contribution, loyalty, affect and professional respect (Dienesch & Liden, 1986; Liden & Maslyn, 1998) and how these four dimensions are related to burnout and occupational self-efficacy. It would also be interesting to collect data in dyadic pairs to remove the invisibility of the manager and reduce issues of common method variance. Of particular interest would be to extend the study to include measures of coping styles adopted by the individuals in response to job demands.

A longitudinal study would be interesting to allow testing of causality. Of further interest would be to examine the role of emotions within the development of burnout. Folkman and Lazarus (1988) suggest that emotion and coping influence each other in a dynamic and mutually reciprocal relationship. They emphasize the temporal quality of emotion and the coping processes and the complex and dynamic nature of emotions and coping in social encounters. To investigate the relationships between emotion and coping it is important to acknowledge that static cross-sectional research such as this study needs to be extended to research designs that allow interindividual analysis of the temporal flow of many person and environmental variables. One such method that could

be utilized is that of a diary study (see, for example, Bolger, Davis & Rafaeli, 2003; for a review of this method).

9.4 PRACTICAL IMPLICATIONS

This study offers important straightforward practical implications for individuals, managers and organizations. Firstly, the results show the importance of personality for the development of both burnout and occupational self-efficacy and the buffering effects that certain personality traits will have in the development of burnout. For example, the findings indicate that individuals who are high in conscientiousness, low in neuroticism, and high in work locus of control will suffer from lower levels of burnout than those low in conscientiousness, high in neuroticism and low in work locus of control. An improvement of selection procedures could assist in matching individuals to available positions. Individuals who are high in neuroticism, low in conscientiousness and external in locus of control are particularly at risk and could be given support and training. Guides are available for individuals to address burnout in the workplace and should be encouraged to engage in these activities (see, for example, Leiter & Maslach, 2005; Maslach & Leiter, 1997).

The finding of this study highlight the direct role played by managers in influencing burnout in their employees. LMX relationships are within the control of organizational members (Harris & Kacmar, 2006) and managers should take responsibility for the well-being of their employees and put time and effort into establishing high-quality relationships with all of their subordinates and in particular monitoring individuals who seem to be becoming disengaged from their work. Managers need to be aware that as employees become stressed they will become more negative and rather than spend less time with them as found in the study of van Dierendonck et al. (2004) need to provide higher-levels of social support. Organizations can reduce the risk of burnout in employees through the development of environments that make social support readily available to employees and through training interventions. In a field experiment of a leadership intervention based on LMX against a control condition involving employees of a large service organization Scandura and Graen (1984) found that an initially low-LMX group made significant gains in job satisfaction, supervisor satisfaction, availability and support from their supervisor and resulted in a productivity improvement of 19%. Steiner (1997) argues for the importance of training new employees about how their relationship with their supervisor will affect their job satisfaction and the need to emphasize their role in the development of the exchange relationship.

Managers can be made aware of their natural tendencies to spend a high proportion of their time with a small number of employees, the risks of managing by exception, and the impact that different styles of communication may have on employee well-being. They need to be aware that communication needs to be positive and that individuals will remember interactions that increased uncertainty in interpersonal interactions (Planlap & Honeycutt, 1985; 1985). They also need to be aware that exchanges in themselves can

be stressful for employees and take steps to reduce uncertainty through for example, setting clear agendas, developing trust and being careful to provide positive as well as negative feedback. They need to be made aware of the findings of this study and those of Bakker et al. (2005) that work demands and emotional demands do not result in higher levels of burnout if employees are provided with high levels of autonomy, receive feedback and have a high-quality relationship with their manager.

This study provides clear findings of the importance of occupational self-efficacy for employee well-being. Employee self-efficacy has been found to be enhanced by allowing employees to participate in group improvement activities, training in interpersonal skills or technical skills and through the provision of increased task control and higher levels of decision making (Axtell & Parker, 2003).

In conclusion, the results of this study indicate that personality, the relationship with their immediate manager, communication frequency, workload and occupational self-efficacy are important factors in the development of burnout. Given the importance of burnout to both the individual and the organization, it is important that the existence and prevalence of burnout is recognized and the factors that influence its development are understood.

APPENDICES
APPENDICES – CHAPTER 3

APPENDIX 3.1 Questionnaire	346
APPENDIX 3.2 Supplementary Table	351
APPENDIX 3.3 Normal Q-Q Plots For Transformed Variables	352

APPENDICES – CHAPTER 4

APPENDIX 4.1 Pattern Matrices for Component Factor Analysis with Oblimin – Rotation for the Variables for Each Analysis	353
APPENDIX 4.2 Normal P-P Plots and Scatter Plots of Regression Standardized Residuals	357
APPENDIX 4.3 Regression Analyses for Transformed Independent Variables	363

APPENDICES – CHAPTER 5

APPENDIX 5.1 Pattern Matrices for Component Factor Analysis with Oblimin – Rotation for the Variables for Each Analysis	367
APPENDIX 5.2 Normal P-P Plots and Scatter Plots of Regression Standardized Residuals	373

APPENDICES – CHAPTER 6

APPENDIX 6.1 Pattern Matrix for Component Factor Analysis with Oblimin – Rotation for the Variables for the Analyses	380
APPENDIX 6.2 Normal P-P Plots and Scatter Plots of Regression Standardized Residuals	382
APPENDIX 6.3 Regression Analyses for Transformed Independent Variables	385

APPENDICES – CHAPTER 7

APPENDIX 7.1 Normal P-P Plots and Scatter Plots of Regression Standardized Residuals	389
---	-----

APPENDICES – CHAPTER 8

APPENDIX 8.1 Pattern Matrices for Component Factor Analysis with Oblimin – Rotation for the Variables for Each Analysis	392
APPENDIX 8.2 Normal P-P Plots and Scatter Plots of Regression Standardized Residuals	398

APPENDIX 3.1 QUESTIONNAIRE

A link to the questionnaire, which was conducted on-line using survey monkey (SurveyMonkey.com), was provided to the individuals surveyed. Respondents were assured of anonymity and confidentiality, and were reassured that there were no right or wrong answers. They were asked not to spend too much time deliberating on any question and were asked to answer as honestly as possible. Each of the scales used is presented below in the order that they were included in the on-line survey:

Occupational Self-Efficacy (OCCSEFF) - 20 item scale (Schyns & von Collani, 2002)

The respondents were asked to complete the following questions relating to their current employment. The responses were made on a 1 to 5 Likert-type scale. Responses were made against the following indicators: 1 - Completely true, 2 - True, 3 - Sometimes true or untrue, 4 - Untrue and 5 - Completely untrue. Reverse items are indicated by [R]. Item 2 was removed following the advice of Schyns and von Collani (2002).

-
1. When I make plans concerning my occupational future, I can make them work
 2. One of my problems is that I cannot get down to work when I should [Removed]
 3. When I set goals for myself in my job I rarely achieve them [R]
 4. When unexpected problems occur in my work, I don't handle them very well [R]
 5. I avoid trying to learn new things in my job when they look too difficult for me [R]
 6. When something doesn't work in my job immediately, I just try harder
 7. I feel insecure about my professional abilities [R]
 8. As far as my job is concerned I am a rather self-reliant person
 9. When something doesn't work well in my job, I give up easily [R]
 10. I do not seem capable of dealing with most problems that come up in my job [R]
 11. I can always manage to solve difficult problems in my job if I try hard enough
 12. Thanks to my resourcefulness, I know how to handle unforeseen situations in my job
 13. If I am in trouble at my work, I can usually think of something to do
 14. I can remain calm when facing difficulties in my job because I can rely on my abilities
 15. When I am confronted with a problem in my job, I can usually find several solutions
 16. I am confident that I could deal efficiently with unexpected events I my job
 17. No matter what comes my way in my job, I am usually able to handle it
 18. My past experiences in my job have prepared me well for my occupational future
 19. I meet the goals that I set for myself in my job
 20. I feel prepared to meet most of the demands in my job
-

Big Five Inventory (BFI) – 17 items to measure Conscientiousness (9 items) and Neuroticism (8 items) (John & Srivastava, 1999)

The respondents were asked to indicate the most relevant answer for each of the statements shown below to the question: “I am someone who”. The responses were made on a 1 to 5 Likert-type scale. Responses were made against the following indicators: 1 - Strongly disagree, 2 - Disagree a little, 3 - Neither agree or disagree, 4 - Agree a little, and 5 - Strongly agree. Reverse items are indicated by [R]. The items relating to conscientiousness are indicated by (C) and to neuroticism by (N).

I am someone who

1. Does a thorough job (C)
 2. Tends to be lazy (C) [R]
 3. Is depressed, blue (N)
 4. Perseveres until the task is finished (C)
 5. Remains calm in tense situations (N) [R]
 6. Tends to be disorganized (C) [R]
 7. Can be moody (N)
 8. Is relaxed, handles stress well (N) [R]
 9. Is a reliable worker (C)
 10. Worries a lot (N)
 11. Is emotionally stable, not easily upset (N) [R]
 12. Can be somewhat careless (C) [R]
 13. Does things efficiently (C)
 14. Can be tense (N)
 15. Gets nervous easily (N)
 16. Makes plans and follows through with them (C)
 17. Is easily distracted (C) [R]
-

Leader-Member Exchange (LMX-7) – 7 item scale (Graen & Uhl-Bien, 1995)

The respondents were asked to indicate the most relevant answer for each of the statements shown below. The responses were made on a 1 to 5 Likert-type scale (1 shown below on the left, to 5 shown on the right).

1. Do you know where you stand with your manager...do you usually know how satisfied your leader is with what you do?

Rarely	Occasionally	Sometimes	Fairly often	Very often
--------	--------------	-----------	--------------	------------
2. How well does your manager understand your job problems and needs?

Not a bit A little A fair amount Quite a bit A great deal

3. How well does your manager recognize your potential?

Not at all A little Moderately Mostly Fully

4. Regardless of how much formal authority he/she has built into his/her position, what are the chances that your manager would use his/her power to help you solve problems in your work?

None Small Moderate High Very high

5. Again, regardless of the amount of formal authority your manager has, what are the chances that he/she would “bail you out,” at his/her expense?

None Small Moderate High Very high

6. I have enough confidence in my manager that I would defend and justify his/her decision if he/she were not present to do so?

Strongly disagree Disagree Neutral Agree Strongly agree

7. How would you characterize your working relationship with your manager?

Extremely ineffective Worse than average Average Better than average Extremely effective

Communication Frequency – 4 item scale (McAllister, 1995)

The respondents were asked to think about how frequently they and their manager communicated. Responses were made on a 1 to 5 scale against the following indicators: 1 - Once or twice in the last six months, 2 – Once or twice every month, 3 – Once or twice every week, 4 – Once or twice daily, 5 – Many times per day.

How frequently

1. Does your manager initiate work-related interaction with you?
2. Do you initiate work-related interaction with your manager?
3. Do you interact with your manager at work?

4. Do you interact with your manager informally or socially at work?
-

Maslach Burnout Inventory (MBI) – 22 item scale (Maslach & Jackson, 1981)

The respondents were asked to respond to each of the statements shown below. Responses were made on a 0 to 6 scale against the following indicators: 0 - Never, 1 – A few times a year, 2 – Monthly, 3 – A few times a month, 4 – Every week, 5 – A few times a week, 6 – Every day.

Emotional Exhaustion:

1. I feel emotionally drained from my work
2. I feel used up at the end of the workday
3. I feel fatigued when I get up in the morning and have to face another day on the job
4. Working with people all day is really a strain for me
5. I feel burned out from my work
6. I feel frustrated by my job
7. I feel I'm working too hard on my job
8. Working with people directly puts too much stress on me
9. I feel like I'm at the end of my tether

Depersonalization:

1. I feel I treat some clients as if they were impersonal "objects"
2. I've become more callous toward people since I took this job
3. I worry that this job is hardening me emotionally
4. I don't really care what happens to some clients
5. I feel clients blame me for some of their problems

Personal Accomplishment

1. I can easily understand how my clients feel about things
 2. I deal very effectively with the problems of my clients
 3. I feel I'm positively influencing other people's lives through my work
 4. I feel very energetic
 5. I can easily create a relaxed atmosphere with my clients
 6. I feel exhilarated after working closely with my clients
 7. I have accomplished many worthwhile things in this job
 8. In work, I deal with emotional problems calmly
-

Work Locus of Control Scale (WLCS) – 16 item scale (Spector, 1988)

The respondents were asked to respond to each of the statements shown below. Responses were made on a 1 to 5 Likert-type scale against the following indicators: 1 - Strongly disagree, 2 - Disagree, 3 - Neither agree or disagree, 4 - Agree, and 5 - Strongly agree. Reverse items are indicated by [R].

1. A job is what you make of it [R]
 2. On most jobs people can pretty much accomplish whatever they set out to accomplish [R]
 3. If you know what you want out of a job, you can find a job that gives it to you [R]
 4. If employees are unhappy with a decision made by their boss, they should do something about it [R]
 5. Getting the job you want is mostly a matter of luck
 6. Making money is primarily a matter of good fortune
 7. Most people are capable of doing their jobs well if they make the effort [R]
 8. In order to get a really good job you need to have family members or friends in high places
 9. Promotions are usually a matter of good fortune
 10. When it comes to landing a really good job, who you know is more important than what you know
 11. Promotions are given to employees who perform well on the job [R]
 12. To make a lot of money you have to know the right people
 13. It takes a lot of luck to be an outstanding employee on most jobs
 14. People who perform their jobs well generally get rewarded for it [R]
 15. Most employees have more influence on their supervisors than they think they do [R]
 16. The main difference between people who make a lot of money and people who make a little money is luck
-

The following background information was collected:

Gender: 0 – Female, 1 – Male

Tenure: Have you worked with your line manager for more than 3 months?

0 - Yes, 1 - No

APPENDIX 3.2 SUPPLEMENTARY TABLE

TABLE A-3.1 OBLIMIN- Rotated Pattern Analysis Matrix for MBI

	<i>Factor</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
EE 1	.76		
EE 2	.72		
EE 3	.83		
EE 4	.52		
EE 5	.73		
EE 6	.61		
EE 7	.73		
EE 8	.65		
EE 9	.76		
rPA 1		.58	
rPA 2		.80	
rPA 3		.80	
rPA 4	.45	.61	
rPA 5		.76	
rPA 6		.74	
rPA 7		.78	
rPA 8		.71	
DEP 1			.55
DEP 2			.84
DEP 3			.81
DEP 4			.77
DEP 5			.42
Percentage of Variance Explained	27.5%	18.5%	9.4%

Note: Bold type indicates significant loadings.
 Only factor loadings above ± 0.4 are shown.

APPENDIX 3.3 PLOTS FOR TRANSFORMED VARIABLES

FIGURE A-3.1 Normal Q-Q Plot for Transformed CF^+ ($CF^+ = \text{LOG}(CF)$)

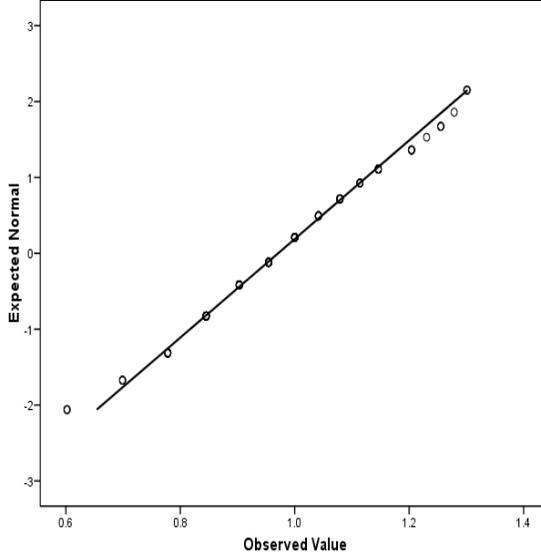
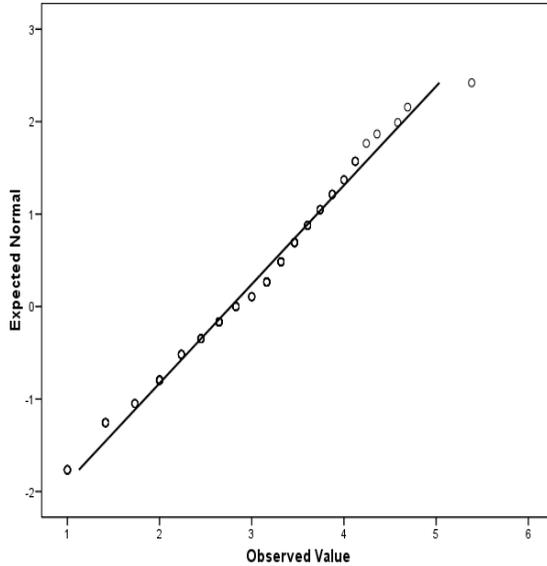


FIGURE A-3.2 Normal Q-Q Plot for Transformed $CONSC^+$ ($CONSC^+ = \text{SQRT}(k - CONSC)$)



APPENDIX 4.1 PATTERN MATRICES FOR COMPONENT FACTOR ANALYSIS WITH OBLIMIN – ROTATION FOR THE VARIABLES FOR EACH ANALYSIS

TABLE A-4.1 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the Emotional Exhaustion Analyses

Scale	<i>Factor</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
EE 3	.81		
EE 5	.78		
EE 1	.76		
EE 9	.75		
EE 7	.74		
EE 2	.69		
EE 8	.67		
EE 6	.65		
EE 4	.57		
LMX 3		.87	
LMX 1		.86	
LMX 7		.85	
LMX 2		.83	
LMX 6		.82	
LMX 5		.78	
LMX 4		.75	
CF 2			-.93
CF 3			-.86
CF 1			-.83
CF 4			-.74

Notes: Only factor loadings above ± 0.35 are shown and only factors above ± 0.49 are significant. EE n: scale items for emotional exhaustion; LMX n: scale items for LMX; CF n: scale items for communication frequency.

TABLE A-4.2 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the Depersonalization Analyses

Scale	<i>Factor</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
DEP 3	.88		
DEP 2	.80		
DEP 4	.72		
DEP 1	.54		
DEP 5	.54		
LMX 2		.86	
LMX 7		.86	
LMX 1		.85	
LMX 3		.84	
LMX 5		.79	
LMX 6		.78	
LMX 4		.75	
CF 2			-.90
CF 1			-.84
CF 3			-.84
CF 4			-.70

Notes: Only factor loadings above ± 0.35 are shown and only factors above ± 0.49 are significant. DEP *n*: scale items for depersonalization; LMX *n*: scale items for LMX; CF *n*: scale items for communication frequency.

TABLE A-4.3 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the reduced Personal Accomplishment Analyses

Scale	<i>Factor</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
rPA 3	.82		
rPA 2	.81		
rPA 6	.78		
rPA 5	.78		
rPA 7	.78		
rPA 8	.64		
rPA 1	.63		
rPA 4	.61		

LMX 1	.86
LMX 3	.85
LMX 7	.84
LMX 2	.83
LMX 6	.82
LMX 5	.80
LMX 4	.77
CF 2	-.93
CF 1	-.84
CF 3	-.84
CF 4	-.70

Notes: Only factor loadings above ± 0.35 are shown and only factors above ± 0.49 are significant. rPA *n*: scale items for reduced personal accomplishment; LMX *n*: scale items for LMX; CF *n*: scale items for communication frequency.

TABLE A- 4.4 Pattern Matrix for Component Factor Analysis with Oblimin-Rotation for Occupational Self-Efficacy Analyses

Scale Item	<i>Factor</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
OCCSEFF 16	.75		
OCCSEFF 17	.74		
OCCSEFF12	.73		
OCCSEFF 15	.71		
OCCSEFF 20	.71		
OCCSEFF 19	.67		
OCCSEFF 7	.65		
OCCSEFF 13	.65		
OCCSEFF 11	.65		
OCCSEFF 14	.62		
OCCSEFF 3	.61		
OCCSEFF 18	.60		
OCCSEFF 1	.60		
OCCSEFF 9	.59		
OCCSEFF 4	.44		
OCCSEFF 5	.44		
OCCSEFF 10	.42		
OCCSEFF 6	.40		

LMX 3	.88
LMX 1	.87
LMX 7	.85
LMX 6	.83
LMX 2	.82
LMX 5	.76
LMX 4	.74
CF 2	.86
CF 1	.82
CF 3	.79
CF 4	.68

Notes: Only factor loadings above ± 0.35 are shown and only factors above ± 0.49 are significant.
 OCCSEFF *n*: scale items for occupational self-efficacy; LMX *n*: scale items for LMX;
 CF *n*: scale items for communication frequency.

APPENDIX 4.2 NORMAL P-P PLOTS AND SCATTER PLOTS OF REGRESSION STANDARDIZED RESIDUALS

FIGURE A-4.1 Normal P-P Plot of Regression Standardized Residuals for Model 7⁺

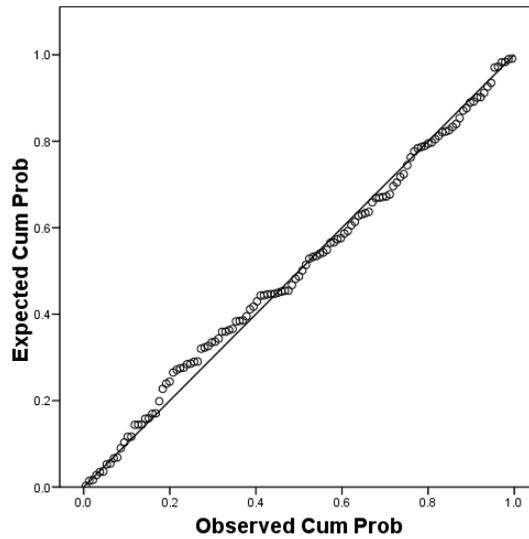


FIGURE A-4.2 Scatterplot of Regression Standardized Residuals for Model 7⁺

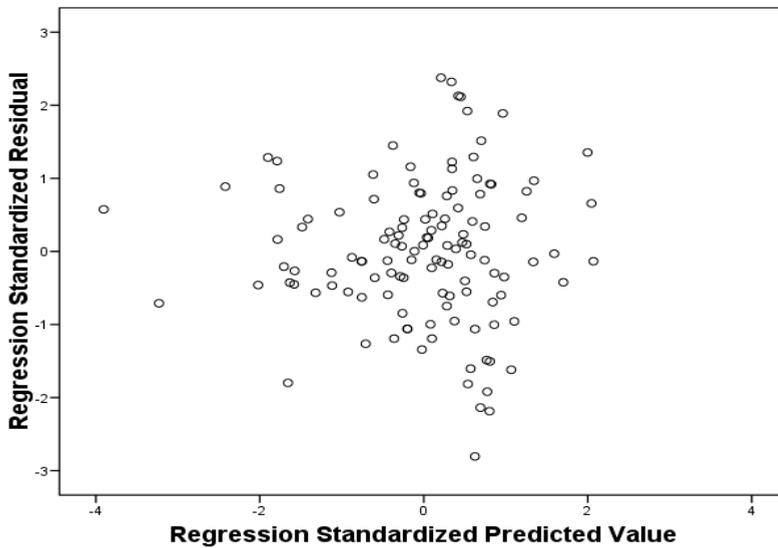


FIGURE A-4.3 Normal P-P Plot of Regression Standardized Residuals for Model 11

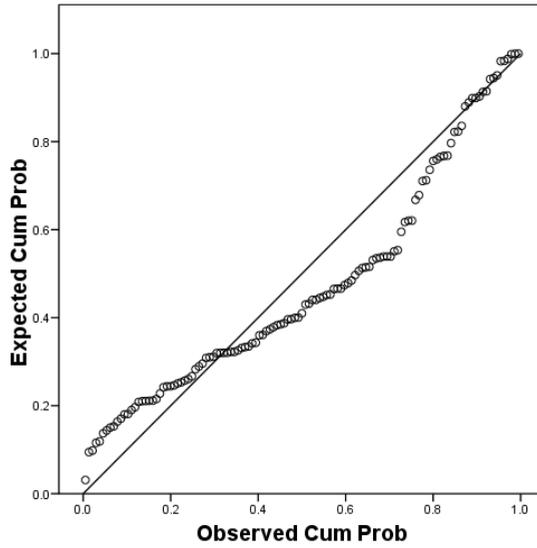


FIGURE A-4.4 Scatterplot of Regression Standardized Residuals for Model 11

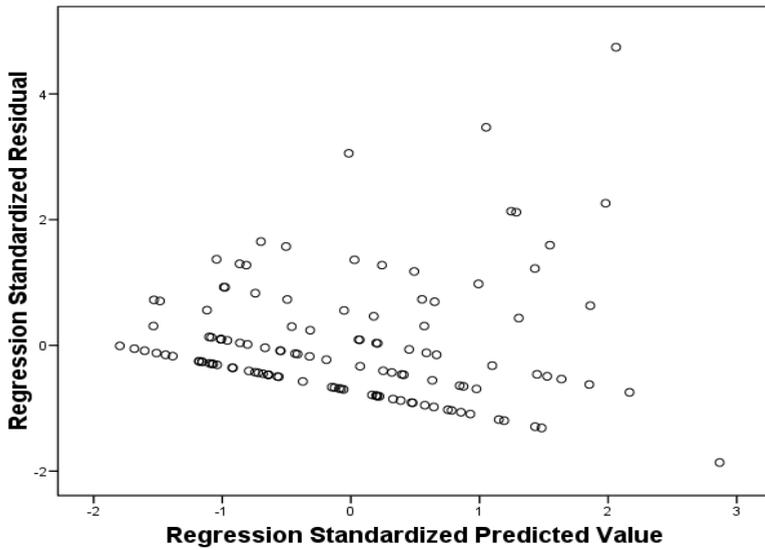


FIGURE A-4.5 Normal P-P Plot of Regression Standardized Residuals for Model 11⁺⁺

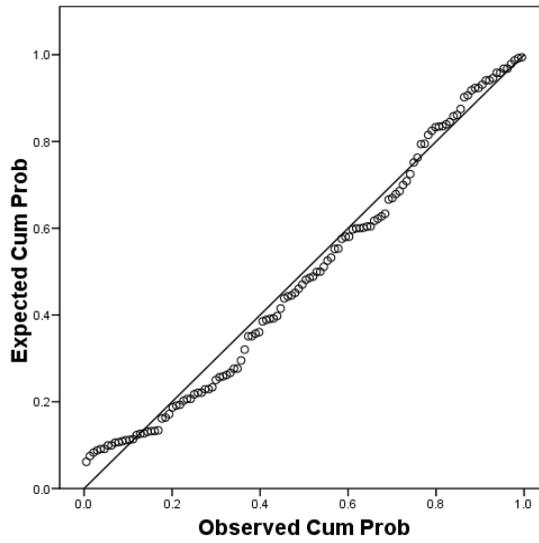


FIGURE A-4.6 Scatterplot of Regression Standardized Residuals for Model 11⁺⁺

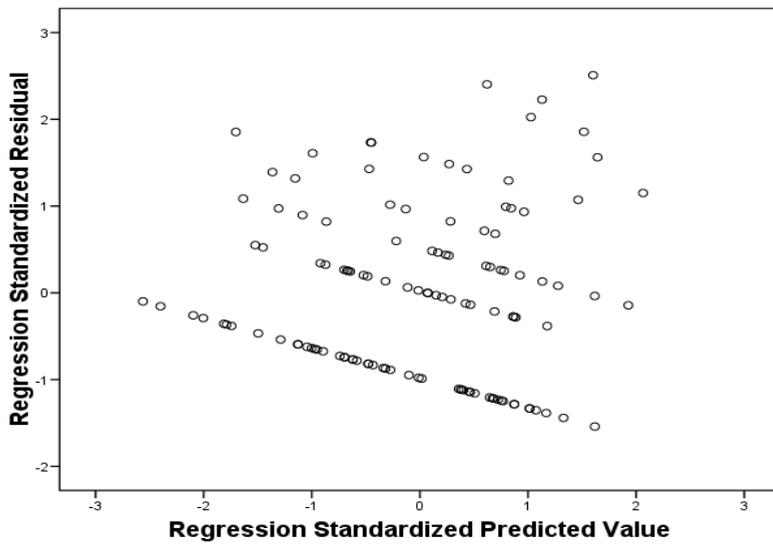


FIGURE A-4.7 Normal P-P Plot of Regression Standardized Residuals for Model 18⁺

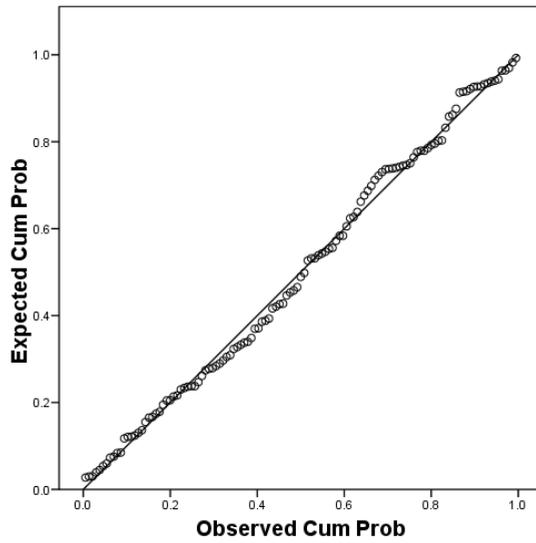


FIGURE A-4.8 Scatterplot of Regression Standardized Residuals for Model 18⁺

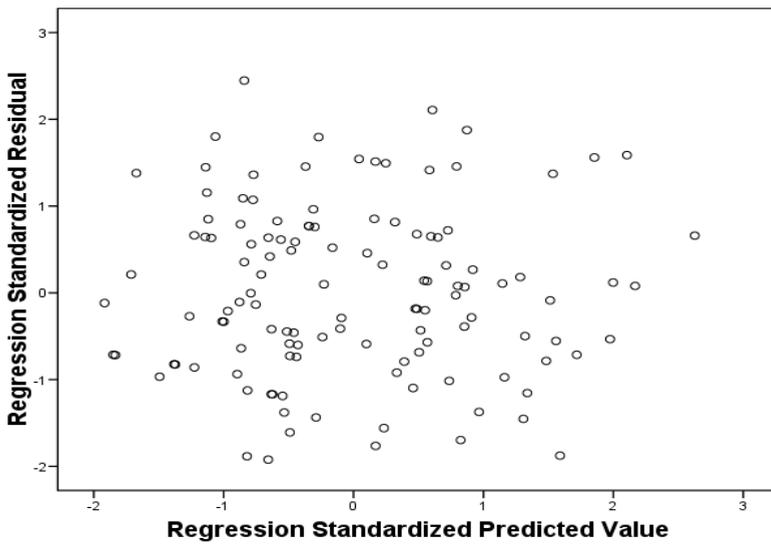


FIGURE A-4.9 Normal P-P Plot of Regression Standardized Residuals for Model 24

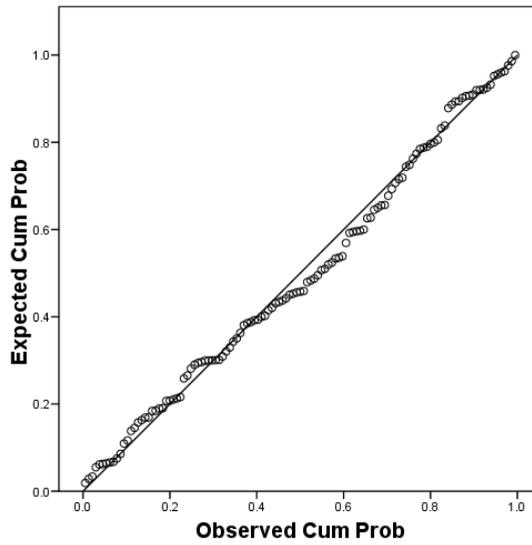


FIGURE A-4.10 Scatterplot of Regression Standardized Residuals for Model 24

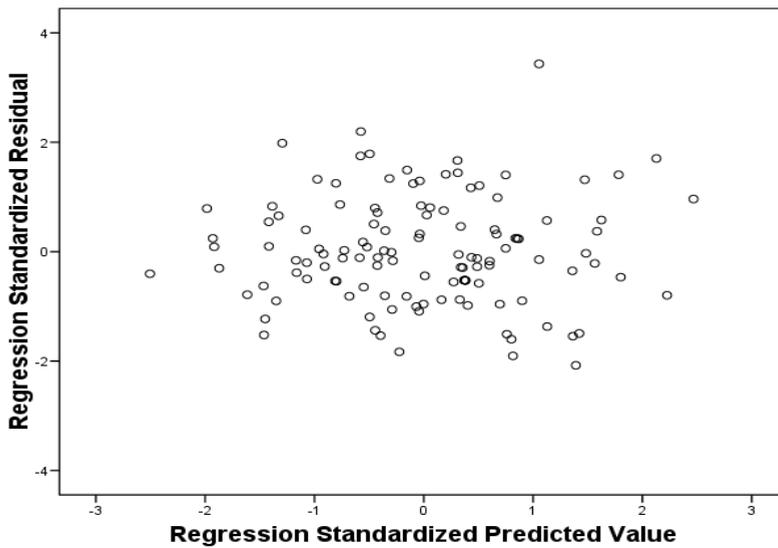


FIGURE A-4.11 Normal P-P Plot of Regression Standardized Residuals for Model 28

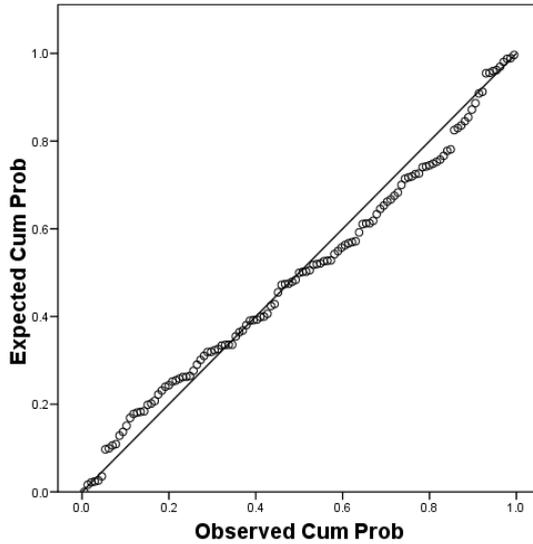
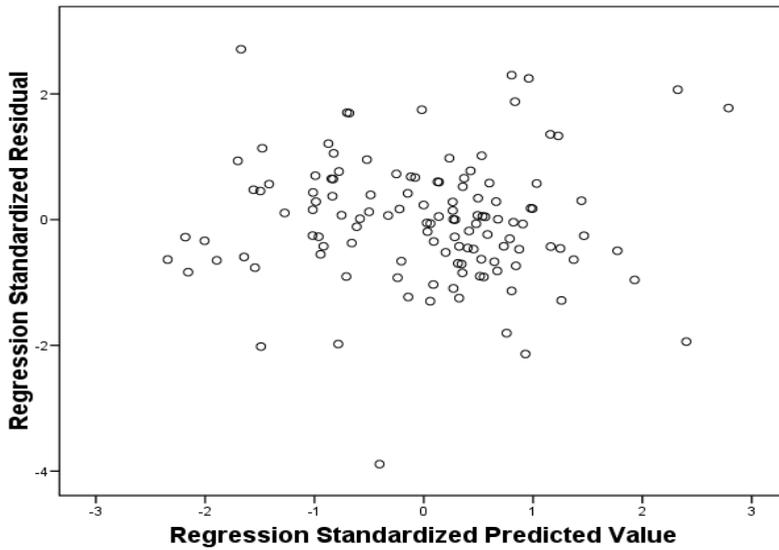


FIGURE A-4.12 Scatterplot of Regression Standardized Residuals for Model 28



**APPENDIX 4.3 REGRESSION ANALYSES RESULTS FOR
TRANSFORMED INDEPENDENT VARIABLES**

**TABLE A-4.5 Regression Analysis for Dependent Variable Transformed
Emotional Exhaustion (EE⁺) and Independent Variable Gender, Tenure and Mean-
Centred Transformed JD⁺ and LMX⁺ and Mean-Centred CF**

Variable	Model 1 ⁺⁺	Model 2 ⁺⁺	Model 4 ⁺⁺	Model 5 ⁺⁺	Model 6 ⁺⁺	Model 7 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	3.692*** (.113)	3.699*** (.110)	3.701*** (.110)	3.849*** (.133)	3.851*** (.134)	3.769*** (.134)
Gender	-.256 (.320)	-.273 (.311)	-.283 (.311)	-.302 (.308)	-.299 (.309)	-.359 (.302)
Tenure	-.097 (.357)	-.152 (.347)	-.154 (.346)	-.164 (.342)	-.173 (.345)	.030 (.345)
Job Demand ⁺	1.864 (1.894)	2.435 (1.849)	2.488 (1.848)	2.168 (1.834)	2.230 (1.854)	2.860 (1.822)
LMX ⁺		.263** (.091)	.310** (.101)	.332** (.101)	.331** (.101)	.132 (.124)
CF			.033 (.030)	.072 [†] (.036)	.073* (.037)	.107** (.038)
CF ²				-.011 [†] (.006)	-.013 [†] (.007)	-.009 (.007)
LMX ⁺ x CF					-.009 (.029)	-.052 (.033)
LMX ⁺ x CF ²						.014** (.005)
<i>F</i> value	.538	2.511*	2.243 [†]	2.539*	2.172*	2.887**
Sig. <i>F</i> Change	.657	.005	.284	.055	.767	.009
<i>R</i> ²	.013	.078	.087	.116	.117	.168
Δ adjusted <i>R</i> ²	-.011	.058	.001	.022	-.007	.047

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable EE⁺ = SQRT (EE).

Transformed dependent variables JD⁺ = LOG (JD) and LMX⁺ = SQRT ($k - \text{LMX}$).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE A-4.6 Regression Analysis for Transformed Dependent Variable reduced Personal Accomplishment (rPA^+) and Independent Variables Gender, Tenure and Mean-Centred Transformed JD^+ , CF^+ and LMX^+

Variable	Model 15 ⁺⁺	Model 16 ⁺⁺	Model 17 ⁺⁺	Model 18 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	5.790*** (.290)	5.805*** (.284)	5.789*** (.231)	5.807*** (.285)
Gender	.681 (.820)	.643 (.803)	.693 (.822)	.632 (.806)
Tenure	.324 (.913)	.201 (.895)	.321 (.915)	.192 (.898)
Job Demand ⁺	5.499 (4.848)	6.772 (4.773)	5.690 (4.865)	6.758 (4.790)
LMX^+		.586* (.235)	-	.638* (.264)
CF^+			-1.216 (1.695)	.810 (1.862)
<i>F</i> value	.692	2.094 [†]	.645	1.702
Sig. <i>F</i> Change	.559	.014	.475	.017
<i>R</i> ²	.017	.066	.021	.068

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 17⁺⁺, the significance of the *F* change is from model 15⁺⁺.

Transformed dependent variable $rPA^+ = rPA^\lambda$, (where, $\lambda = 0.7$).

Transformed dependent variables $JD^+ = \text{LOG}(JD)$, $CF^+ = \text{LOG}(CF)$ and $LMX^+ = \text{SQRT}(k - LMX)$.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE A-4.7 Regression Analysis for Dependent Variable Unidimensional Burnout (MBI) and Independent Variables Gender, Tenure and Transformed JD⁺ and LMX⁺ and Mean-Centred CF

Variable	Model 19 ⁺⁺	Model 20 ⁺⁺	Model 21 ⁺⁺	Model 23 ⁺⁺	Model 24 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	29.614*** (1.455)	29.618*** (1.443)	29.725*** (1.376)	29.745*** (1.373)	31.455*** (1.662)
Gender	.551 (4.116)	.393 (4.083)	.130 (3.894)	-.029 (3.885)	-.244 (3.850)
Tenure	2.084 (4.581)	2.250 (4.544)	1.390 (4.339)	1.361 (4.327)	1.249 (4.287)
Job Demand ⁺		41.873 [†] (24.130)	50.756* (23.142)	51.562* (23.084)	47.858* (22.964)
LMX ⁺			4.092*** (1.140)	4.802*** (1.262)	5.056*** (1.259)
CF				.494 (.381)	.945* (.454)
CF ²					-.131 [†] (.073)
<i>F</i> value	.107	1.076	4.106**	3.640**	3.623**
Sig. <i>F</i> Change	.899	.085	.000	.197	.076
<i>R</i> ²	.002	.026	.122	.135	.158

Notes: *n* = 128; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variables JD⁺ = LOG (JD) and LMX⁺ = SQRT (*k* – LMX).

[†] *p* < .1; * *p* < .05; ** *p* < .01; and *** *p* < .001.

TABLE A-4.8 Regression Analysis for Dependent Variable Occupational Self-Efficacy (OCCSEFF) and Independent Variables Gender and Tenure and Mean-Centred Transformed JD⁺, CF⁺ and LMX⁺

Variable	Model 25 ⁺⁺	Model 26 ⁺⁺	Model 27 ⁺⁺	Model 28 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)
Constant	74.045*** (.768)	73.998*** (.744)	74.055*** (.748)	74.017*** (.740)
Gender	1.124 (2.172)	1.241 (2.106)	-1.011 (2.118)	1.138 (2.094)
Tenure	1.556 (2.418)	1.939 (2.346)	1.583 (2.357)	1.855 (2.333)
Job Demand ⁺	-5.959 (12.839)	-9.911 (12.514)	-7.797 (12.534)	-10.041 (12.440)
CF ⁺		-	11.746** (4.368)	7.490 (4.836)
LMX ⁺		-1.820** (.617)		-1.340 [†] (.687)
<i>F</i> value	.278	2.399 [†]	2.027 [†]	2.422*
Sig. <i>F</i> Change	.841	.004	.008	.053
<i>R</i> ²	.007	.075	.064	.094

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 27⁺⁺, the significance of the *F* change is from model 25⁺⁺.

Transformed dependent variables $JD^+ = \text{LOG}(JD)$, $CF^+ = \text{LOG}(CF)$ and $LMX^+ = \text{SQRT}(k - LMX)$.

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

APPENDIX 5.1 PATTERN MATRICES FOR COMPONENT FACTOR ANALYSIS WITH OBLIMIN – ROTATION FOR THE VARIABLES FOR EACH ANALYSIS

TABLE A-5.1 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the Emotional Exhaustion Analyses

Scale Item	<i>Factor</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
EE 1	.74				
EE 2	.67				
EE 3	.80				
EE 4	.54				
EE 5	.79				
EE 6	.62				
EE 7	.69				
EE 8	.59				
EE 9	.66				
WLCS 1		-.71			
WLCS 2		-.64			
WLCS 3		-.56			
WLCS 4		-.47			
WLCS 7		-.69			
WLCS 5			.56		
WLCS 6			.57		
WLCS 8			.69		
WLCS 9			.74		
WLCS 10			.73		
WLCS 11					
WLCS 12			.81		
WLCS 13			.67		
WLCS 14			.40		
WLCS 15			.36		
WLCS 16			.66		
CONSC 1				.62	
CONSC 2				.44	
CONSC 3				.62	
CONSC 4				.37	.40
CONSC 5				.60	

CONSC 6	.38	.44
CONSC 7	.62	
CONSC 8	.69	
CONSC 9	.48	
NEURO 1		-.51
NEURO 2		-.62
NEURO 3		-.66
NEURO 4		-.58
NEURO 5		-.55
NEURO 6		-.53
NEURO 7		-.64
NEURO 8		-.60

Only factor loadings above ± 0.35 are shown and only factors above ± 0.49 are significant. EE *n*: scale items for emotional exhaustion; CONSC *n*: scale items for conscientiousness; NEURO *n*: scale items for neuroticism, WLCS *n*: scale items for work locus of control.

TABLE A-5.2 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the Depersonalization Analyses

Scale Item	<i>Factor</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
DEP 1	.63				
DEP 2	.76				
DEP 3	.72				
DEP 4	.73				
DEP 5	.45				
WLCS 1		-.71			
WLCS 2		-.71			
WLCS 3		-.64			
WLCS 4		-.46			
WLCS 7		-.69			
WLCS 11		-.39			
WLCS 5			.58		
WLCS 6			.63		
WLCS 8			.60		
WLCS 9			.78		
WLCS 10			.68		
WLCS 12			.76		

WLCS 13	.68	
WLCS 14	.44	
WLCS 15		
WLCS 16	.65	
<hr/>		
CONSC 1	.61	
CONSC 2	.40	
CONSC 3	.62	
CONSC 4	.40	-.42
CONSC 5	.57	
CONSC 6		
CONSC 7	.63	
CONSC 8	.67	
CONSC 9	.48	-.37
<hr/>		
NEURO 1		.64
NEURO 2		.55
NEURO 3		.68
NEURO 4		.68
NEURO 5		.68
NEURO 6		.58
NEURO 7		.76
NEURO 8		.56

Only factor loadings above ± 0.35 are shown and only factors above ± 0.49 are significant.
 DEP *n*: scale items for depersonalization; CONSC *n*: scale items for conscientiousness; NEURO *n*: scale items for neuroticism, WLCS *n*: scale items for work locus of control.

TABLE A-5.3 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the reduced Personal Accomplishment Analyses

Scale Item	<i>Factor</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
rPA 1	.67				
rPA 2	.82				
rPA 3	.77				
rPA 4	.50				
rPA 5	.78				
rPA 6	.76				
rPA 7	.72				

rPA 8	.64	
WLCS 1	.70	
WLCS 2	.66	
WLCS 3	.63	
WLCS 4	.38	
WLCS 7	.67	
WLCS 11	.40	
WLCS 5	.59	
WLCS 6	.55	
WLCS 8	.67	
WLCS 9	.78	
WLCS 10	.75	
WLCS 12	.78	
WLCS 13	.69	
WLCS 14	.44	
WLCS 15		
WLCS 16	.67	
CONSC 1	.64	
CONSC 2	.43	
CONSC 3	.62	
CONSC 4	.36	-.40
CONSC 5	.60	
CONSC 6	.39	
CONSC 7	.60	
CONSC 8	.66	
CONSC 9	.48	-.37
NEURO 1	.68	
NEURO 2	.58	
NEURO 3	.69	
NEURO 4	.66	
NEURO 5	.65	
NEURO 6	.58	
NEURO 7	.75	
NEURO 8	.57	

Only factor loadings above ± 0.35 are shown and only factors above ± 0.49 are significant.
 rPA *n*: scale items for reduced personal accomplishment; CONSC *n*: scale items for conscientiousness; NEURO *n*: scale items for neuroticism, WLCS *n*: scale items for work locus of control.

TABLE A-5.4 Pattern Matrix for Component Factor Analysis with Oblimin-Rotation for the Occupational Self-Efficacy Analyses

Scale Item	<i>Factor</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
OCCSEFF 1	.44	-.51			
OCCSEFF 3					
OCCSEFF 4					-.49
OCCSEFF 5	.48				
OCCSEFF 6					
OCCSEFF 7	.50				
OCCSEFF 8	.37				
OCCSEFF 9	.50				
OCCSEFF 10	.47				
OCCSEFF 11	.54				
OCCSEFF 12	.70				
OCCSEFF 13	.50				
OCCSEFF 14	.65				
OCCSEFF 15	.64				
OCCSEFF 16	.77				
OCCSEFF 17	.68				
OCCSEFF 18	.41	-.38			
OCCSEFF 19	.37	-.49			
OCCSEFF 20	.58				
WLCS 1		-.66			
WLCS 2		-.62			
WLCS 3		-.55			
WLCS 4		-.46			
WLCS 7		-.59			
WLCS 5			.61		
WLCS 6			.50		
WLCS 8			.65		
WLCS 9			.78		
WLCS 10			.77		
WLCS 11			.44		
WLCS 12			.79		
WLCS 13			.67		
WLCS 14			.48		

WLCS 15		
WLCS 16	.69	
<hr/>		
CONSC 1	.67	
CONSC 2	.47	
CONSC 3	.58	
CONSC 4	.42	-.40
CONSC 5	.54	
CONSC 6	.42	-.40
CONSC 7	.57	
CONSC 8	.64	
CONSC 9	.49	-.38
<hr/>		
NEURO 1		.67
NEURO 2	-.38	.49
NEURO 3		.73
NEURO 4		.62
NEURO 5		.61
NEURO 6		.56
NEURO 7		.73
NEURO 8		.52
<hr/>		

Only factor loadings above ± 0.35 are shown and only factors above ± 0.49 are significant.
 OCCSEFF *n*: scale items for occupational self-efficacy; LMX *n*: scale items for LMX; CF *n*: scale items for communication frequency.

APPENDIX 5.2 NORMAL P-P PLOTS AND SCATTER PLOTS OF REGRESSION STANDARDIZED RESIDUALS

FIGURE A-5.1 Normal P-P Plot of Regression Standardized Residuals for Model 34⁺

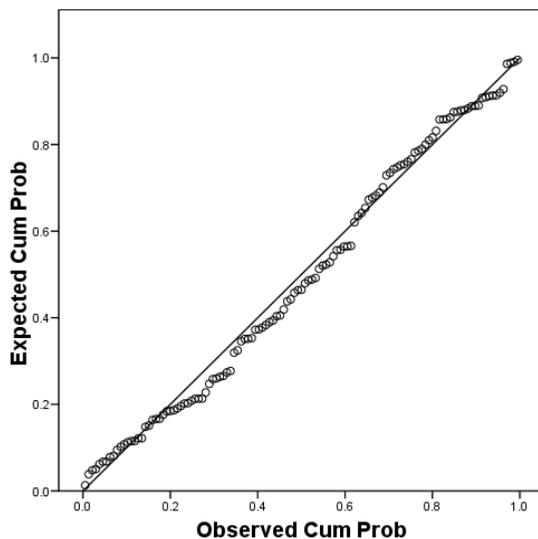


FIGURE A-5.2 Scatterplot of Regression Standardized Residuals for Model 34⁺

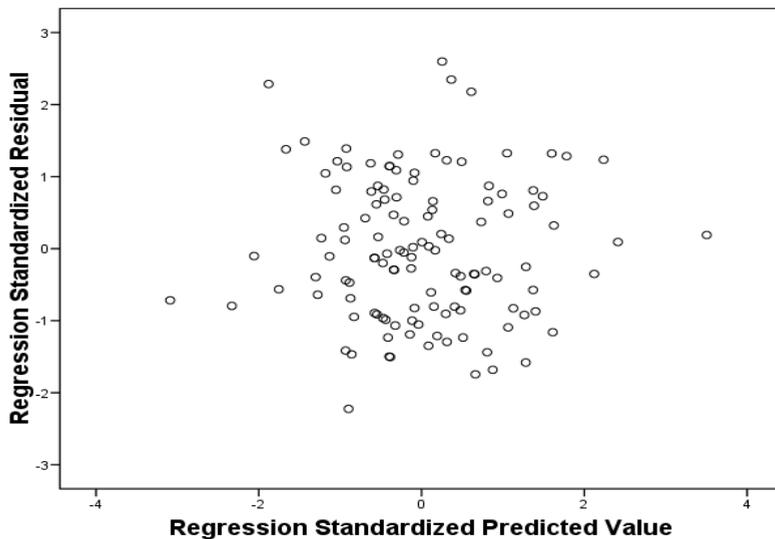


FIGURE A-5.3 Normal P-P Plot of Regression Standardized Residuals for Model 42

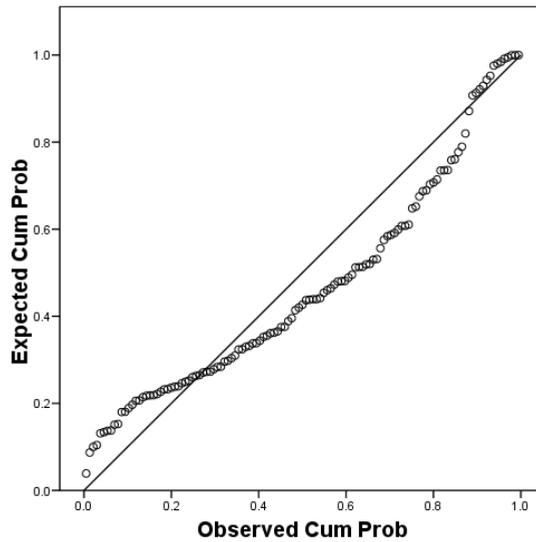


FIGURE A-5.4 Scatterplot of Regression Standardized Residuals for Model 42

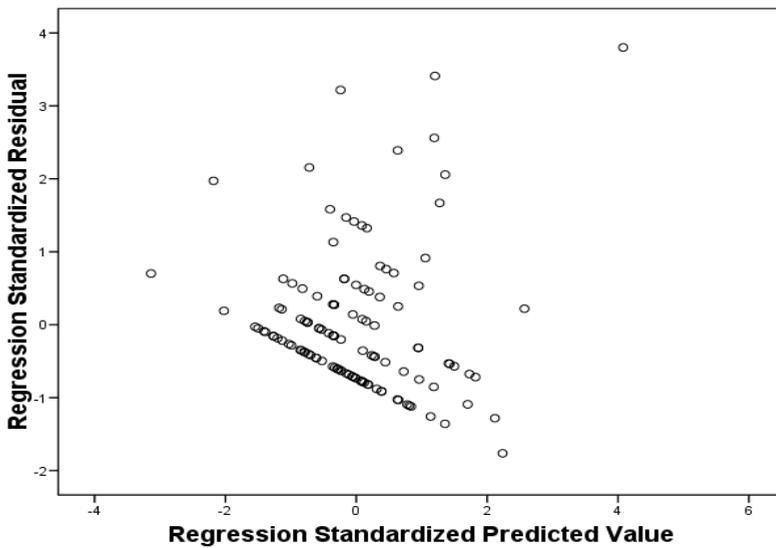


FIGURE A-5.5 Normal P-P Plot of Regression Standardized Residuals for Model 42⁺⁺

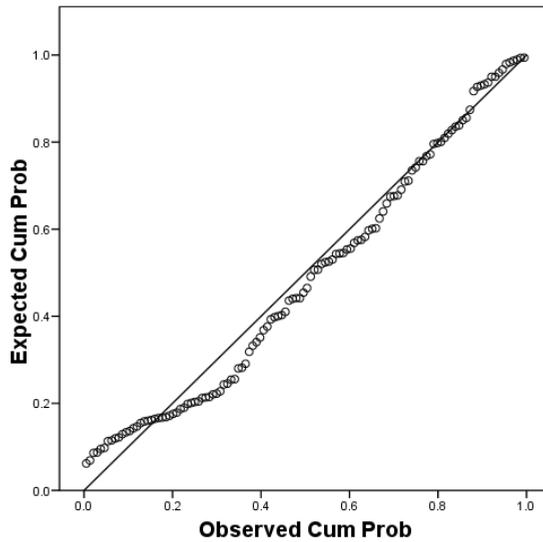


FIGURE A-5.6 Scatterplot of Regression Standardized Residuals for Model 42⁺⁺

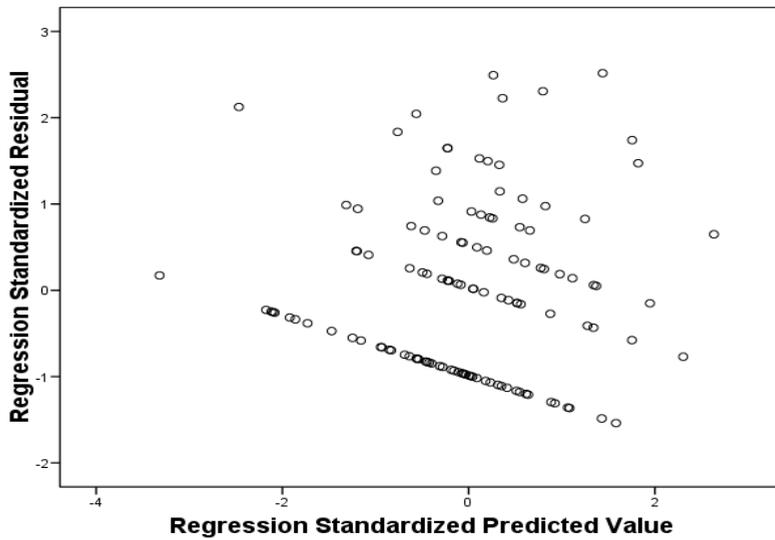


FIGURE A-5.7 Normal P-P Plot of Regression Standardized Residuals for Model 50⁺

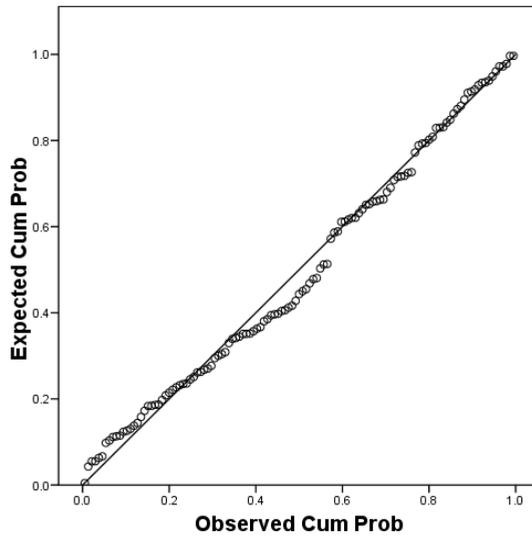


FIGURE A-5.8 Scatterplot of Regression Standardized Residuals for Model 50⁺

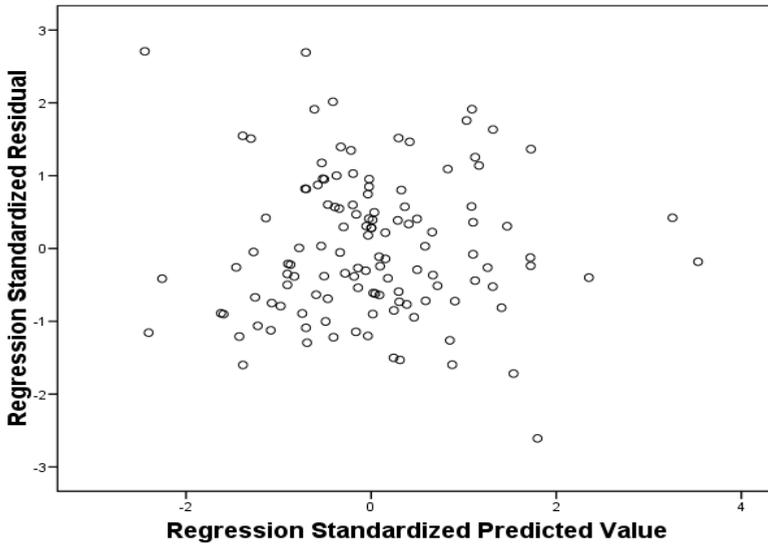


FIGURE A-5.9 Normal P-P Plot of Regression Standardized Residuals for Model 54

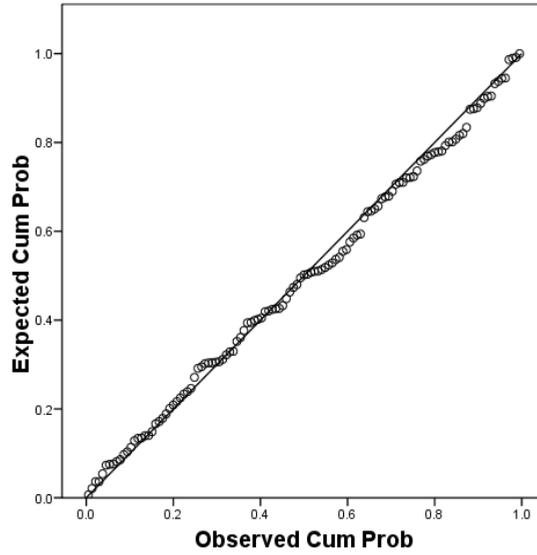


FIGURE A-5.10 Scatterplot of Regression Standardized Residuals for Model 54

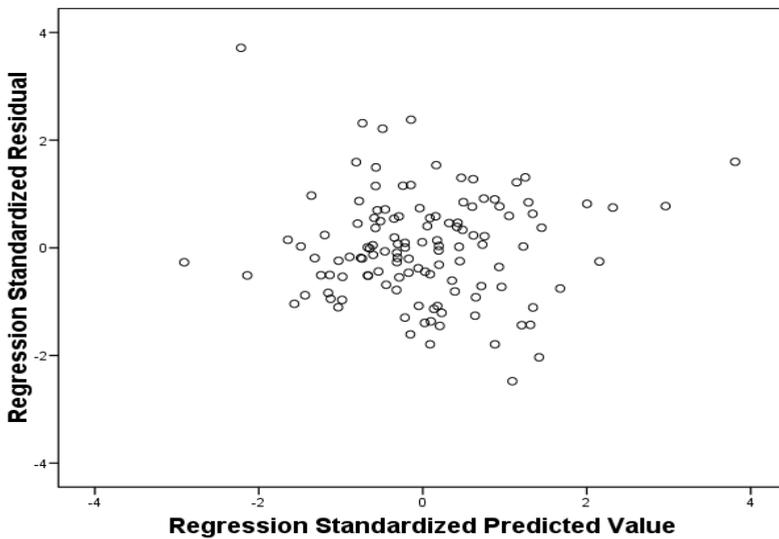


FIGURE A-5.11 Normal P-P Plot of Regression Standardized Residuals for Model 61

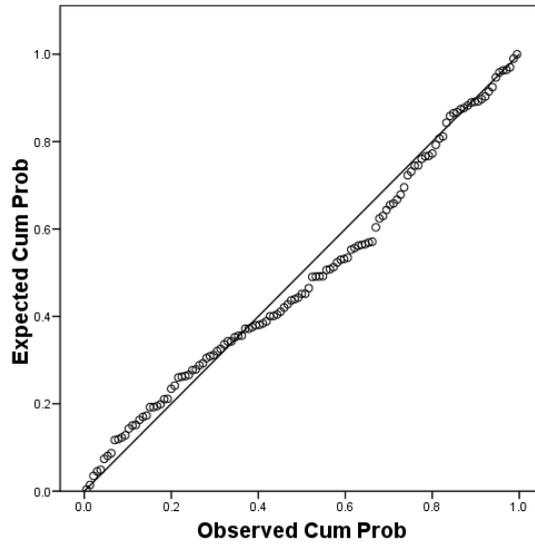


FIGURE A-5.12 Scatterplot of Regression Standardized Residuals for Model 61

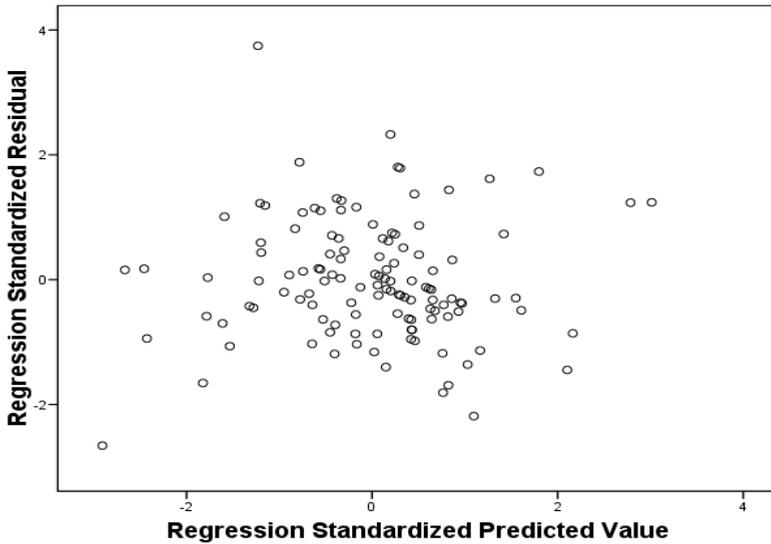


FIGURE A-5.13 Normal P-P Plot of Regression Standardized Residuals for Model 66

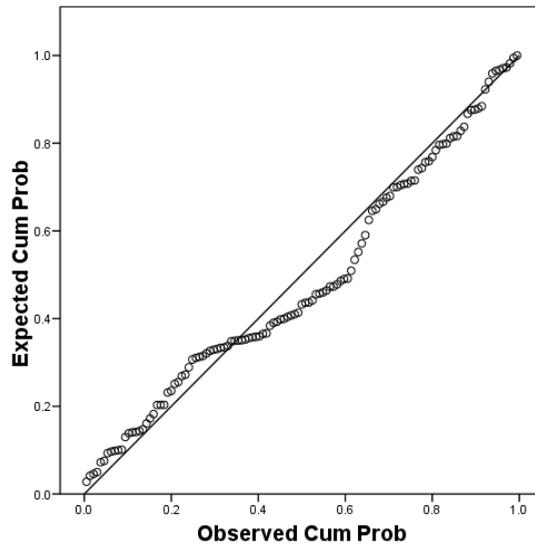
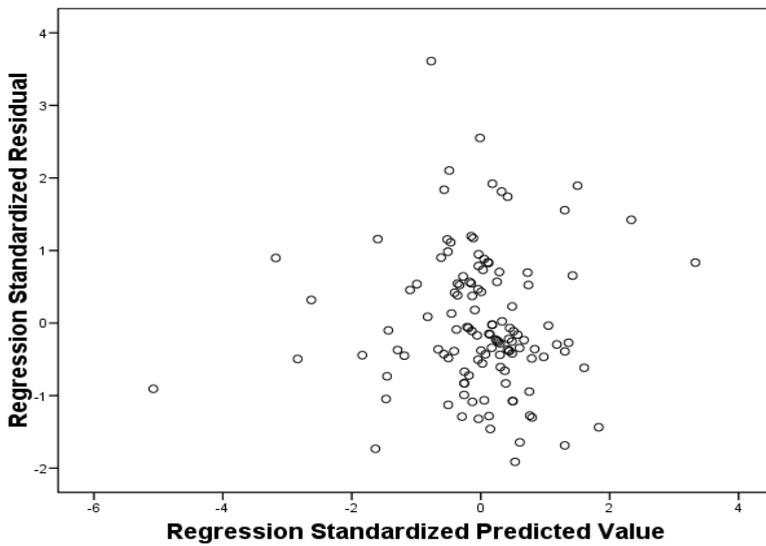


FIGURE A-5.14 Scatterplot of Regression Standardized Residuals for Model 66



APPENDIX 6.1 SUPPLEMENTARY TABLE

TABLE A-6.1 Pattern Matrix for Component Factor Analysis with Oblimin-Rotation

Scale Item	<i>Factor</i>					
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
LMX 1	.83					
LMX 2	.78					
LMX 3	.85					
LMX 4	.74					
LMX 5	.71					
LMX 6	.82					
LMX 7	.82					
CF 1		.83				
CF 2		.88				
CF 3		.78				
CF 4		.61				
WLCS 1			.70			
WLCS 2			.70			
WLCS 3			.60			
WLCS 4			.45			
WLCS 7			.70			
WLCS 11			.38	.38		
WLCS 14				.43		
WLCS 15						
WLCS 5				.59		
WLCS 6				.53		
WLCS 8				.67		
WLCS 9				.77		
WLCS 10				.75		
WLCS 12				.79		
WLCS 13				.68		
WLCS 16				.69		
CONSC 1					.63	
CONSC 2						
CONSC 3					.53	
CONSC 4					.37	-.42
CONSC 5					.61	
CONSC 6					.40	-.40
CONSC 7					.68	
CONSC 8					.65	
CONSC 9					.39	
NEURO 1						.64
NEURO 2						.56

NEURO 3	.71
NEURO 4	.69
NEURO 5	.67
NEURO 6	.54
NEURO 7	.71
NEURO 8	.59

Note: Only factor loadings above ± 0.35 are shown.

**APPENDIX 6.2 NORMAL P-P PLOTS AND SCATTER PLOTS OF
REGRESSION STANDARDIZED RESIDUALS**

**FIGURE A-6.1 Normal P-P Plot of Regression Standardized Residuals for Model
72⁺**

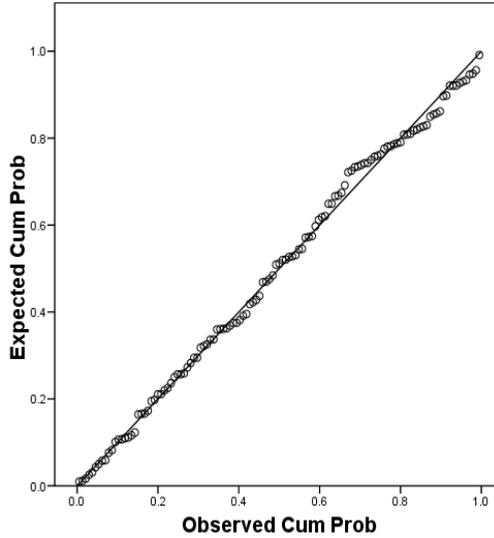


FIGURE A-6.2 Scatterplot of Regression Standardized Residuals for Model 72⁺

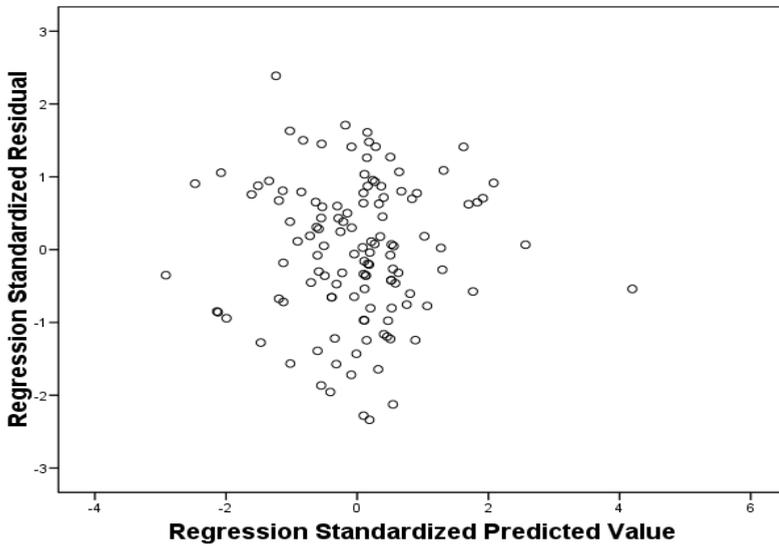


FIGURE A-6.3 Normal P-P Plot of Regression Standardized Residuals for Model 84⁺

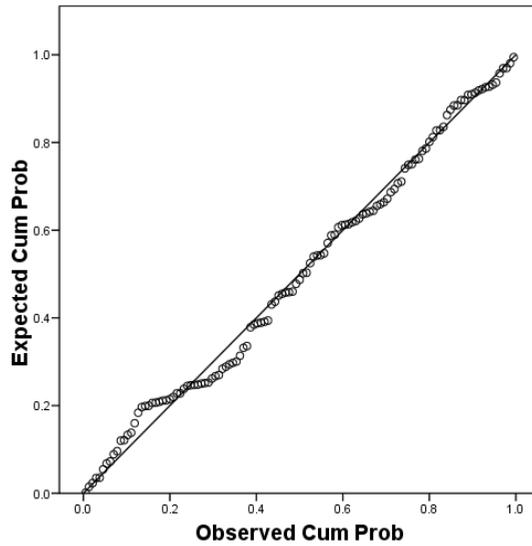


FIGURE A-6.4 Scatterplot of Regression Standardized Residuals for Model 84⁺

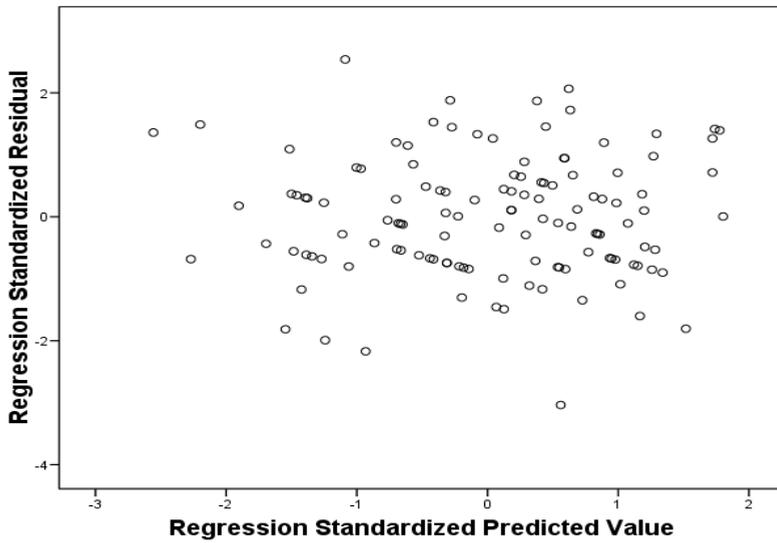


FIGURE A-6.5 Normal P-P Plot of Regression Standardized Residuals for Model 84

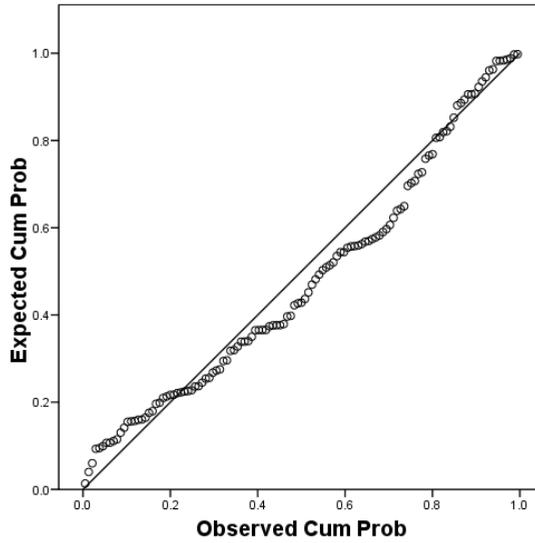
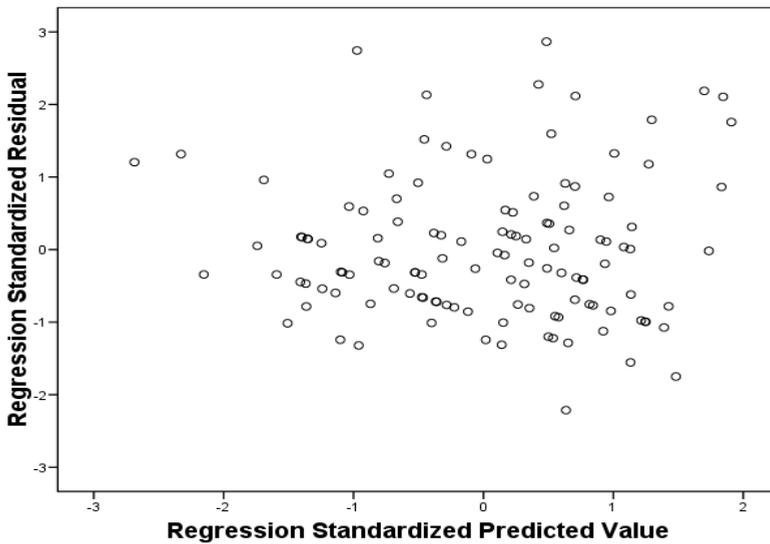


FIGURE A-6.6 Scatterplot of Regression Standardized Residuals for Model 84



APPENDIX 6.3 REGRESSION ANALYSES RESULTS FOR TRANSFORMED INDEPENDENT VARIABLES

TABLE A-6.2 Regression Analyses for Transformed Dependent Variable Leader Member Exchange (LMX⁺) and Independent Variables Gender, Tenure and Transformed Mean-Centred JD⁺ and CF⁺, and Mean-Centred CONSC, NEURO and WLCS

Variable	Model 67 ⁺⁺	Model 68 ⁺⁺	Model 69 ⁺⁺	Model 70 ⁺⁺	Model 71 ⁺⁺	Model 73 ⁺⁺
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)
Constant	3.058*** (.111)	3.055*** (.099)	3.075*** (.107)	3.060*** (.108)	3.046*** (.108)	2.944*** (.125)
Gender	.064 (.313)	.095 (.281)	-.022 (.304)	.073 (.307)	.135 (.305)	.000 (.301)
Tenure	.210 (.348)	.203 (.312)	.135 (.338)	.174 (.341)	.254 (.339)	.190 (.335)
Job Demand ⁺	-2.171 (1.849)	-1.674 (1.660)	-2.515 (1.792)	-2.178 (1.812)	-3.330 [†] (1.843)	-2.945 (1.785)
CF ⁺		-3.175*** (.579)	-	-	-	-
CONSC			-.057** (.019)	-	-	-.040 [†] (.020)
NEURO				.039* (.016)	-	-
WLCS					-.039** (.014)	-
CONSC ²						.005 [†] (.002)
<i>F</i> value	.595	8.087***	2.804*	1.964	2.473*	3.044*
Sig. <i>F</i> Change	.619	.000	.003	.016	.005	.055
<i>R</i> ²	.015	.215	.087	.062	.077	.115
Adjusted <i>R</i> ²	-.010	.189	.056	.031	.046	.077

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models. For model 69⁺⁺, 70⁺⁺ and 71⁺⁺, the significance of the *F* change is from model 67⁺⁺. For model 73⁺⁺, the significance of the *F* change is from model 69⁺⁺.

Transformed dependent variable LMX⁺ = SQRT($k - \text{LMX}$). Transformed independent variables JD⁺ = LOG(JD) and CF⁺ = LOG(CF).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE A-6.3 Regression Analyses for Transformed Dependent Variable Leader Member Exchange (LMX⁺) and Independent Variables Gender, Tenure and Transformed Mean-Centred JD⁺ and Mean-centered CONSC, NEURO and WLCS

Variable	Model 67 ⁺⁺	Model 72 ⁺⁺	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>Beta</i> (β)
Constant	3.058*** (.111)	2.919*** (.122)	
Gender	.064 (.313)	.093 (.294)	.027
Tenure	.210 (.348)	.230 (.327)	.060
Job Demand ⁺	-2.171 (1.849)	-3.790* (1.779)	-.187*
CONSC		-.019 (.022)	-.090
CONSC ²		.005* (.002)	.206*
NEURO		.027 (.016)	.152
WLCS		-.031* (.013)	-.204*
<i>F</i> value	.595	3.505**	
Sig. <i>F</i> Change	.619	.000	
<i>R</i> ²	.015	.176	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

Transformed dependent variable LMX⁺ = SQRT ($k - \text{LMX}$).

Transformed independent variables JD⁺ = LOG (JD).

[†] $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

TABLE A-6.4 Regression Analyses for Transformed Dependent Variable Communication Frequency (CF⁺) and Independent Variables Gender, Tenure and Mean-Centered Transformed JD⁺, CONSC⁺, and LMX⁺ and Mean-Centered NEURO and WLCS

Variable	Model 75 ⁺⁺	Model 76 ⁺⁺	Model 77 ⁺⁺	Model 78 ⁺⁺	Model 79 ⁺⁺	Model 80 ⁺⁺
	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	B (s.e.)	<i>B</i> (<i>s.e.</i>)
Constant	.970*** (.016)	.968*** (.014)	.971*** (.016)	.970*** (.014)	.970*** (.016)	.968*** (.014)
Gender	.010 (.044)	.014 (.040)	.008 (.045)	.007 (.040)	.009 (.044)	.014 (.040)
Tenure	-.002 (.049)	.011 (.044)	-.005 (.050)	.005 (.044)	.001 (.049)	.012 (.045)
Job Demand ⁺	.156 (.263)	.017 (.237)	.153 (.264)	-.005 (.235)	.157 (.262)	.019 (.238)
CONSC ⁺		- - -	.008 (.015)	.026 [†] (.014)	- - -.003 (.002)	- - -.001 (.002)
NEURO		- -		- -		
WLCS		- -		- -		
LMX ⁺		-.064*** (.012)		-.069*** (.012)		-.063*** (.012)
<i>F</i> value	.138	7.660***	.175	6.975***	.588	6.106***
Sig. <i>F</i> Change	.937	.000	.873	.000	.167	.000
<i>R</i> ²	.003	.206	.006	.230	.020	.207

Notes: *n* = 128; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 77⁺⁺ and 79⁺⁺, the significance of the *F* change is from model 75⁺⁺.

Transformed dependent variable CF⁺ = LOG (CF). Transformed dependent variables JD⁺ = LOG (JD), CONSC⁺ = SQRT (*k* - CONSC) and LMX⁺ = SQRT (*k* - LMX).

[†] *p* < .1; * *p* < .05; ** *p* < .01; and *** *p* < .001.

TABLE A-6.5 Regression Analyses for Transformed Dependent Variable Communication Frequency (CF⁺) and Independent Variables Gender, Tenure and Mean-Centered Transformed JD⁺, CONSC⁺, and LMX⁺ and Mean-Centered NEURO and WLCS

Variable	Model 81 ⁺⁺	Model 82 ⁺⁺	Model 83 ⁺⁺		Model 84 ⁺⁺	
	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	<i>B</i> (<i>s.e.</i>)	β	<i>B</i> (<i>s.e.</i>)	β
Constant	.972*** (.015)	.969*** (.014)	.973*** (.015)		.971*** (.014)	
Gender	.001 (.044)	.009 (.040)	-.006 (.044)	-.013	.000 (.040)	.001
Tenure	-.007 (.049)	.008 (.044)	-.011 (.048)	-.020	.001 (.044)	.001
Job Demand ⁺	.293 (.265)	.092 (.244)	.290 (.263)	.101	.088 (.241)	.031
CONSC ⁺	- -	- -	.025 (.016)	.151	.034* (.015)	.207*
NEURO	- -	- -	-.004 (.002)	-.157	-.002 (.002)	-.091
WLCS	.005* (.002)	.002 (.002)	.005* (.002)	.226*	.003 (.002)	.130
LMX ⁺		-.060*** (.012)			-.063*** (.012)	.448***
<i>F</i> value	1.467	6.447***	1.607		5.523***	
Sig. <i>F</i> Change	.021	.000	.031		.000	
<i>R</i> ²	.047	.216	.077		.252	

Notes: $n = 128$; unstandardized coefficients are reported for the respective regression steps, with standard errors in parentheses.

For the *F* value, the significance refers to the change in the *F* value between models.

For model 81⁺⁺ and 83⁺⁺, the significance of the *F* change is from model 75⁺⁺.

Transformed dependent variable CF⁺ = LOG (CF). Transformed dependent variables JD⁺ = LOG (JD), CONSC⁺ = SQRT ($k - \text{CONSC}$) and LMX⁺ = SQRT ($k - \text{LMX}$).

† $p < .1$; * $p < .05$; ** $p < .01$; and *** $p < .001$.

APPENDIX 7.1 NORMAL P-P PLOTS AND SCATTER PLOTS OF REGRESSION STANDARDIZED RESIDUALS

FIGURE A-7.1 Normal P-P Plot of Regression Standardized Residuals for Model 95⁺

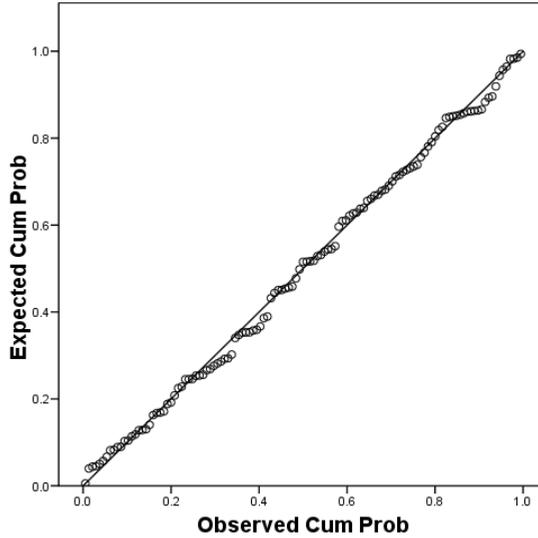


FIGURE A-7.2 Scatterplot of Regression Standardized Residuals for Model 95⁺

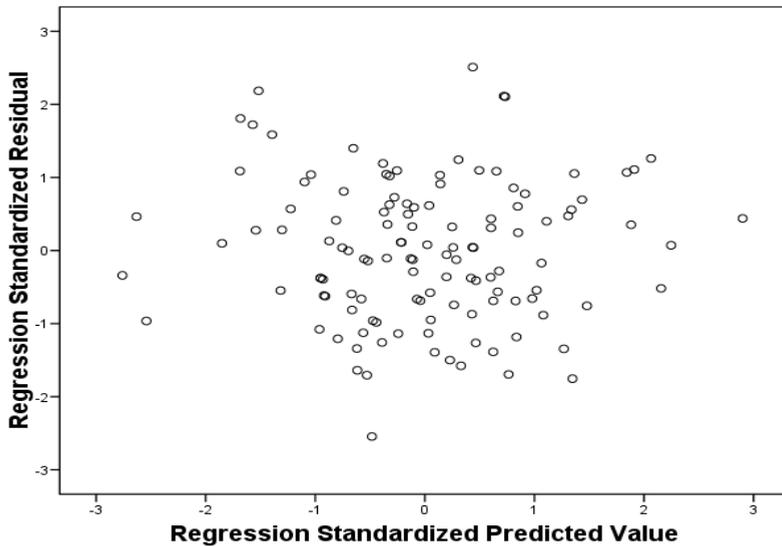


FIGURE A-7.3 Normal P-P Plot of Regression Standardized Residuals for Model 95

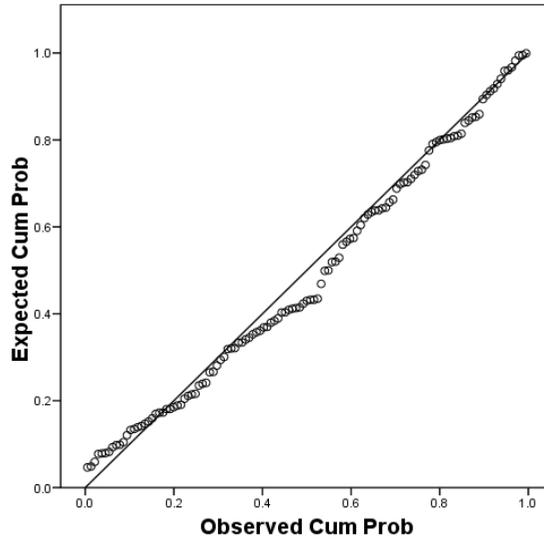


FIGURE A-7.4 Scatterplot of Regression Standardized Residuals for Model 95

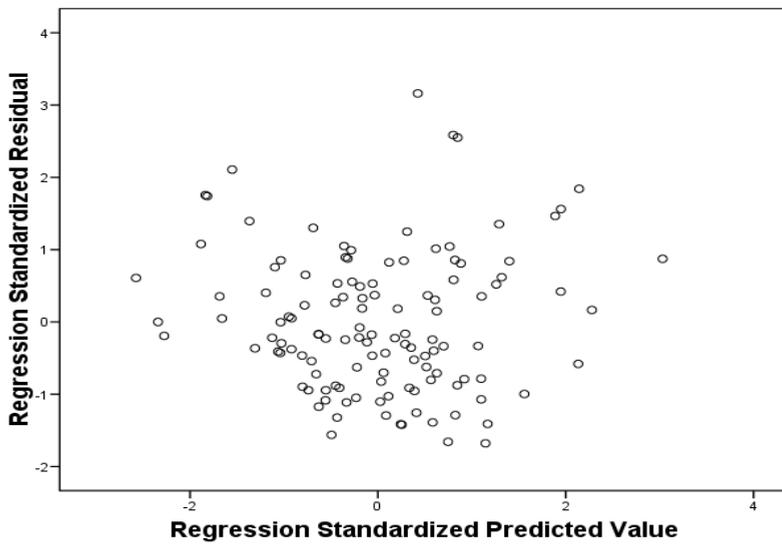


FIGURE A-7.5 Normal P-P Plot of Regression Standardized Residuals for Model 104⁺⁺

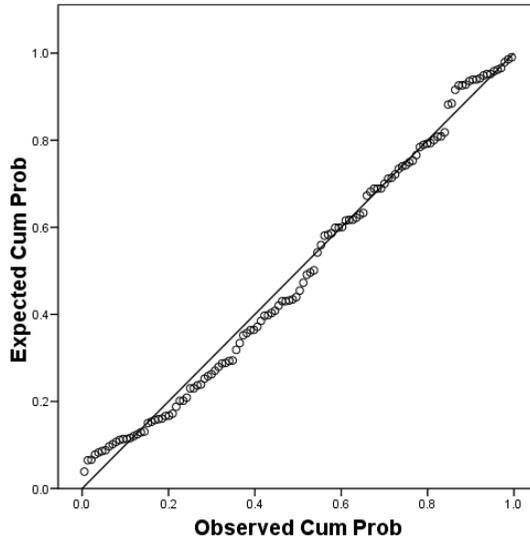
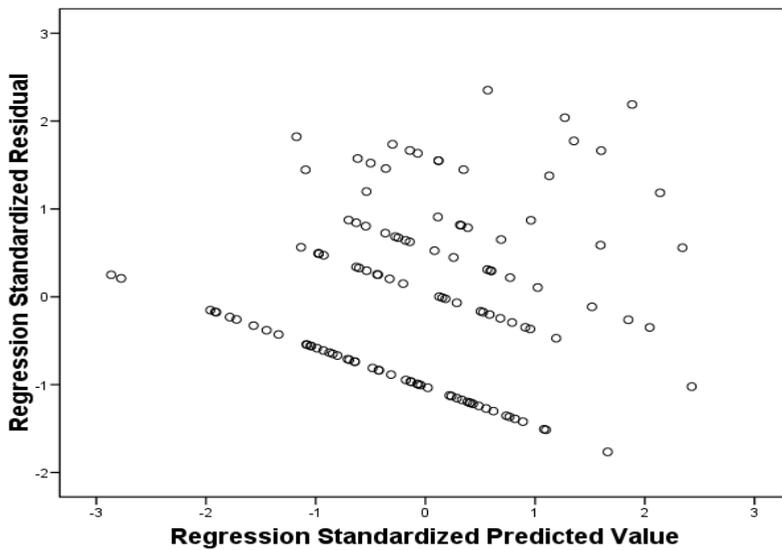


FIGURE A-7.6 Scatterplot of Regression Standardized Residuals for Model 104⁺⁺



APPENDIX 8.1 PATTERN MATRICES FOR COMPONENT FACTOR ANALYSIS WITH OBLIMIN – ROTATION FOR THE VARIABLES FOR EACH ANALYSIS

TABLE A-8.1 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the Emotional Exhaustion Analyses

Scale Item	<i>Factor</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
EE 1	.75				
EE 2	.66				
EE 3	.77				
EE 4	.53				
EE 5	.79				
EE 6	.58				
EE 7	.74				
EE 8	.63				
EE 9	.74				
WLCS 1		.69			
WLCS 2		.66			
WLCS 3		.57			
WLCS 4		.49			
WLCS 7		.61			
WLCS 5			-.61		
WLCS 6			-.51		
WLCS 8			-.68		
WLCS 9			-.76		
WLCS 10			-.75		
WLCS 11					
WLCS 12			-.78		
WLCS 13			-.65		
WLCS 14			-.42		
WLCS 15					
WLCS 16			-.66		
CONSC 1				.70	
CONSC 2				.52	
CONSC 3				.57	
CONSC 4				.52	
CONSC 5				.51	
CONSC 6				.55	
CONSC 7				.50	
CONSC 8				.64	
CONSC 9				.57	
OCCSEFF 1					.44
OCCSEFF 3					.40
OCCSEFF 4					.42

OCCSEFF 5		.44
OCCSEFF 6		
OCCSEFF 7		.56
OCCSEFF 8		
OCCSEFF 9	.41	.52
OCCSEFF 10		.43
OCCSEFF 11		.65
OCCSEFF 12		.75
OCCSEFF 13		.55
OCCSEFF 14		.72
OCCSEFF 15		.68
OCCSEFF 16		.75
OCCSEFF 17		.71
OCCSEFF 18		.51
OCCSEFF 19		.42
OCCSEFF 20		.56

Only factor loadings above ± 0.40 are shown.

EE *n*: scale items for emotional exhaustion; CONSC *n*: scale items for conscientiousness; WLCS *n*: scale items for work locus of control; OCCSEFF *n*: scale items for occupational self-efficacy.

TABLE A-8.2 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the Depersonalization Analyses

Scale Item	<i>Factor</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
DEP 1	.65				
DEP 2	.75				
DEP 3	.72				
DEP 4	.67				
DEP 5	.44				
WLCS 1		-.65			
WLCS 2		-.65			
WLCS 3		-.56			
WLCS 4		-.47			
WLCS 7		-.63			
WLCS 5			-.62		
WLCS 6			-.57		
WLCS 8			-.62		
WLCS 9			-.81		
WLCS 10			-.72		
WLCS 11			-.40		
WLCS 12			-.76		
WLCS 13			-.66		
WLCS 14			-.46		
WLCS 15					

WLCS 16	- .65
CONSC 1	-.64
CONSC 2	-.47
CONSC 3	-.56
CONSC 4	-.60
CONSC 5	-.49
CONSC 6	-.52
CONSC 7	-.51
CONSC 8	-.60
CONSC 9	-.61
OCCSEFF 1	.45
OCCSEFF 3	.46
OCCSEFF 4	.46
OCCSEFF 5	.45
OCCSEFF 6	
OCCSEFF 7	.59
OCCSEFF 8	
OCCSEFF 9	.52
OCCSEFF 10	.42
OCCSEFF 11	.66
OCCSEFF 12	.78
OCCSEFF 13	.57
OCCSEFF 14	.72
OCCSEFF 15	.66
OCCSEFF 16	.75
OCCSEFF 17	.73
OCCSEFF 18	.51
OCCSEFF 19	.47
OCCSEFF 20	.60

Only factor loadings above ± 0.40 are shown.

DEP *n*: scale items for depersonalization; CONSC *n*: scale items for conscientiousness; WLCS *n*: scale items for work locus of control; OCCSEFF *n*: scale items for occupational self-efficacy.

**TABLEA-8.3 Pattern Matrix for Component Factor Analysis with Oblimin -
Rotation for the reduced Personal Accomplishment Analyses**

Scale Item	<i>Factor</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
rPA 1	.68				
rPA 2	.78				
rPA 3	.79				
rPA 4	.49				
rPA 5	.77				
rPA 6	.75				
rPA 7	.73				
rPA 8	.61				
WLCS 1		.60			
WLCS 2		.59			
WLCS 3		.56			
WLCS 4		.46			
WLCS 7		.58			
WLCS 5			.61		
WLCS 6			.50		
WLCS 8			.68		
WLCS 9			.80		
WLCS 10			.77		
WLCS 11			.41		
WLCS 12			.77		
WLCS 13			.66		
WLCS 14			.46		
WLCS 15					
WLCS 16			.67		
CONSC 1				.66	
CONSC 2				.52	
CONSC 3				.57	
CONSC 4				.56	
CONSC 5				.51	
CONSC 6				.57	
CONSC 7				.47	
CONSC 8				.61	
CONSC 9				.61	
OCCSEFF 1					.49
OCCSEFF 3					.45
OCCSEFF 4					.52
OCCSEFF 5					.41
OCCSEFF 6					
OCCSEFF 7				.60	
OCCSEFF 8					
OCCSEFF 9					.49
OCCSEFF 10					

OCCSEFF 11	.69
OCCSEFF 12	.74
OCCSEFF 13	.59
OCCSEFF 14	.74
OCCSEFF 15	.63
OCCSEFF 16	.76
OCCSEFF 17	.75
OCCSEFF 18	.50
OCCSEFF 19	.47
OCCSEFF 20	.59

Only factor loadings above ± 0.40 are shown.

rPA *n*: scale items for reduced personal accomplishment; CONSC *n*: scale items for conscientiousness; WLCS *n*: scale items for work locus of control; OCCSEFF *n*: scale items for occupational self-efficacy.

TABLE A-8.4 Pattern Matrix for Component Factor Analysis with Oblimin - Rotation for the Unidimensional Measure of Burnout Analyses

Scale Item	<i>Factor</i>						
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
EE 1	.74						
EE 2	.63						
EE 3	.78						
EE 4	.53						
EE 5	.77						
EE 6	.54						
EE 7	.72						
EE 8	.63						
EE 9	.72						
DEP 1		.61					
DEP 2		.70					
DEP 3		.65					
DEP 4		.68					
DEP 5							
rPA 1			.61				
rPA 2			.75				
rPA 3			.78				
rPA 4	.41		.55				
rPA 5			.75				
rPA 6			.75				
rPA 7			.74				
rPA 8			.60				
WLCS 1				.69			
WLCS 2				.64			
WLCS 3				.55			
WLCS 4				.45			

WLCS 7	.60	
WLCS 5		-.58
WLCS 6		-.56
WLCS 8		-.66
WLCS 9		-.80
WLCS 10		-.71
WLCS 11		
WLCS 12		-.76
WLCS 13		-.66
WLCS 14		-.43
WLCS 15		
WLCS 16		-.63
<hr/>		
CONSC 1		.68
CONSC 2		.48
CONSC 3		.58
CONSC 4		.52
CONSC 5		.52
CONSC 6		.54
CONSC 7		.48
CONSC 8		.62
CONSC 9		.57
<hr/>		
OCCSEFF 1	.42	.46
OCCSEFF 3		
OCCSEFF 4		.45
OCCSEFF 5		.41
OCCSEFF 6		
OCCSEFF 7		.54
OCCSEFF 8		
OCCSEFF 9		.40
OCCSEFF 10		
OCCSEFF 11		.68
OCCSEFF 12		.74
OCCSEFF 13		.55
OCCSEFF 14		.73
OCCSEFF 15		.64
OCCSEFF 16		.75
OCCSEFF 17		.72
OCCSEFF 18		.49
OCCSEFF 19		.42
OCCSEFF 20		.55

Only factor loadings above ± 0.40 are shown.

EE *n*: scale items for emotional exhaustion; DEP *n*: scale items for depersonalization; rPA *n*: scale items for reduced personal accomplishment; CONSC *n*: scale items for conscientiousness; WLCS *n*: scale items for work locus of control; OCCSEFF *n*: scale items for occupational self-efficacy.

APPENDIX 8.2 NORMAL P-P PLOTS AND SCATTER PLOTS OF REGRESSION STANDARDIZED RESIDUALS

FIGURE A-8.1 Normal P-P Plot of Regression Standardized Residuals for Model 124⁺

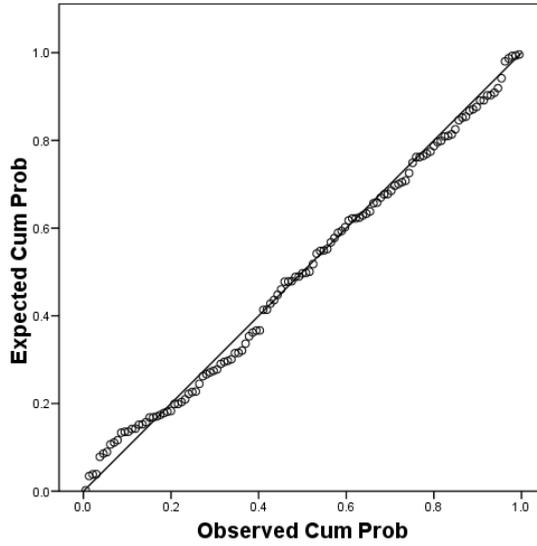


FIGURE A-8.2 Scatterplot of Regression Standardized Residuals for Model 124⁺

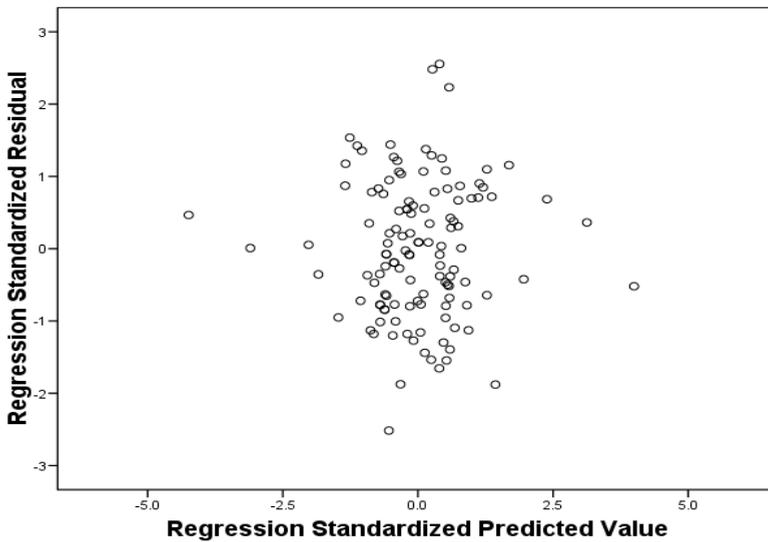


FIGURE A-8.3 Normal P-P Plot of Regression Standardized Residuals for Model 130⁺

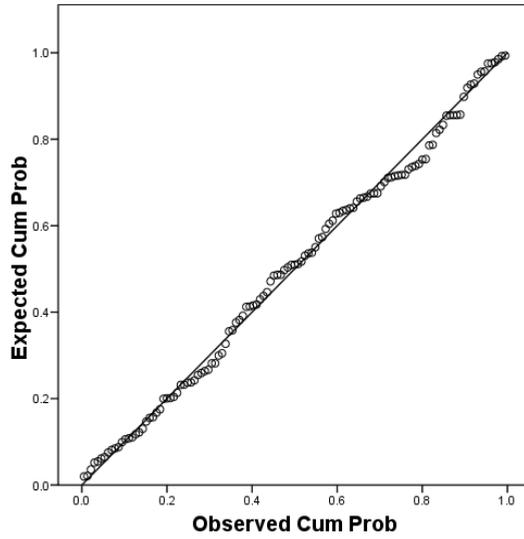


FIGURE A-8.4 Scatterplot of Regression Standardized Residuals for Model 130⁺

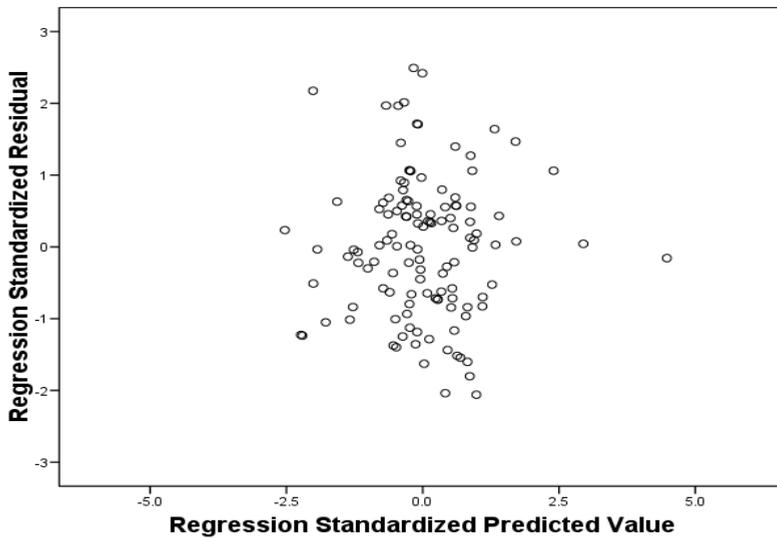


FIGURE A-8.5 Normal P-P Plot of Regression Standardized Residuals for Model 135

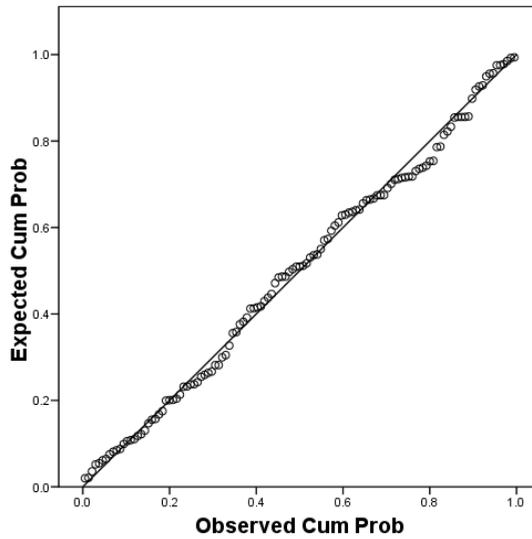
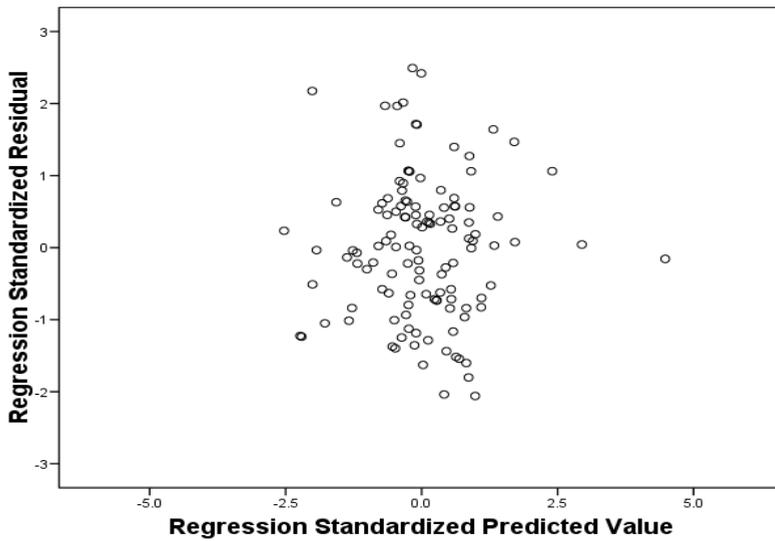


FIGURE A8-6 Scatterplot of Regression Standardized Residuals for Model 135



REFERENCES

- Aiken, L. S., & West, S. G. 1991. *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.
- Albrecht, T. L., & Adelman, M. B. 1984. Social support and life stress: New directions for communication research. *Human Communication Research*, 11: 3-32.
- Albrecht, T. L., & Adelman, M. B. 1987a. Rethinking the relationship between communication and social support: An introduction. In T. L. Albrecht & M. B. Adelman, (Eds.), *Communicating Social Support*, 13-16. Newbury Park, CA: Sage.
- Albrecht, T. L., & Adelman, M. B. 1987b. Communicating social support: A theoretical perspective. In T. L. Albrecht & M. B. Adelman, (Eds.), *Communicating Social Support*, 18-39. Newbury Park, CA: Sage.
- Albrecht, T. L., & Adelman, M. B. 1987c. Dilemmas of supportive communication. In T. L. Albrecht & M. B. Adelman, (Eds.), *Communicating Social Support*, 240-269. Newbury Park, CA: Sage.
- Allen, I., Barrett, G., Birdthistle, I., Bonell, C., Brooker, C., Dennison, C., Fenton, C., French, R., Gerressu, M., Glasier, A., Grundy, C., Hadley, A., Hart, G., Hastings, G., Ingham, R., Jacklin, P., Kane, R., Kingori, P., Lachowycz, K., Lam, P., McVey, D., Mercer, C., Normand, C., Parker, R., Simpson, C., Stephenson, J., Stevens, M., Thomson, R., Wellings, K., Wilkinson, P., Williams, B., Williams, S., & Yankah, E. 2005. *Teenage Pregnancy Strategy Evaluation*, Retrieved from: <http://www.everychildmatters.gov.uk/health/teenagepregnancy/research/>
- Anderson, C. R., & Schneier, C. E. 1978. Locus of control, leader behaviour and leader performance among management students. *Academy of Management Journal*, 21: 690-698.
- Andrews, M. C., & Kacmar, K. M. 2001. Confirmation and extension of the sources of feedback scale in service-based organizations. *The Journal of Business Communication*, 38: 206-226.
- Antonovsky, A. 1991. The structural sources of salutogenic strengths. In C. L. Cooper & R. Payne, (Eds.), *Personality and Stress: Individual Differences in the Stress Process*, 67-104. Chichester: Wiley.
- Aryee, S., & Chen, Z. C. 2006. Leader-member exchange in a Chinese context: Antecedents, the mediating role of psychological empowerment and outcomes. *Journal of Business Research*, 59: 793-801.
- Ashford, S. J., & Cummings, L. L. 1983. Feedback as an individual resource: Personal strategies of creating information. *Organizational Behavior and Human Performance*, 32: 370-398.
- Ashford, S. J., & Tsui, A. S. 1991. Self-regulation for managerial effectiveness: The role of active feedback seeking. *Academy of Management Journal*, 34: 251-280.

-
- Axtell, C. M., & Parker, S. K. 2003. Promoting role breadth self-efficacy through involvement, work redesign and training. *Human Relations*, 56: 113-131.
- Baker, D. D., & Ganster, D. C. 1985. Leader communication style: A test of average versus vertical dyad linkage models. *Group and Organization Studies*, 10: 242-259.
- Bakker, A. B., Demerouti, E., & Euwema, M. C. 2005. Job resources buffer the impact of job demands on burnout. *Journal of Occupational Health Psychology*, 10: 170-180.
- Bakker, A. B., Demerouti, E., Taris, T., Schaufeli, W. B., & Schreurs, P. 2003. A multi-group analysis of the job demands-resources model to predict burnout and performance. *International Journal of Stress Management*, 10: 16-38.
- Bakker, A. B., Demerouti, E., & Verbeke, W. 2004. Using the job demands-resource model to predict burnout and performance. *Human Resource Management*, 43: 83-104.
- Bakker, A. B., van Der Zee, K. I., Lewig, K. A., & Dollard, M. F. 2006. The relationship between the big five personality factors and burnout: A study among volunteer counsellors. *The Journal of Social Psychology*, 146: 31-50.
- Bandura, A. 1977. *Social Learning Theory*. Upper Saddle River, NJ: Prentice Hall.
- Bandura, A. 1986. *Social Foundations of Thought and Action. A Social Cognitive Theory*. New Jersey: Prentice-Hall.
- Bandura, A. 1989. Human agency in social cognitive theory. *American Psychologist*, 44: 1175-1184.
- Bandura, A. 1995. Exercise of personal and collective efficacy in changing societies. In A. Bandura, (Ed.), *Self-Efficacy in Changing Societies*, 1-45. Cambridge: Cambridge University Press.
- Bandura, A. 1997. *Self-Efficacy: The Exercise of Control*. New York: Freeman.
- Barner-Rasmussen, W. 2003. Determinates of the feedback seeking behaviour of subsidiary top managers in multinational corporations. *International Business Review*, 12: 41-60.
- Baron, R. M., & Kenny, D. A. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51: 1173-1182.
- Barrick, M. R., & Mount, M. K. 1991. The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44: 1-26.
- Barrick, M. R., & Mount, M. K. 1993. Autonomy as a moderator of the relationship between the Big Five personality dimensions and job performance. *Journal of Applied Psychology*, 78: 111-118.
- Barrick, M. R., & Mount, M. K. 2005. Yes, personality matters: Moving on to more important matters. *Human Performance*, 18: 359-372.

- Barrick, M. R., Mount, M. K., & Judge, T. A. 2001. Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *Personality and Performance*, 9: 9-30.
- Barrick, M. R., Parks, L., & Mount, M. K., 2005. Self-monitoring as a moderator of the relationships between personality traits and performance. *Personnel Psychology*, 58: 745-767.
- Basch, J., & Fisher, C. D. 2000. Affective events-emotion matrix: A classification of work events and associated emotions. In N. M. Ashkanasay, C. E. J. Hartel & W. J. Zerbe (Eds.) *Emotions in the Work Place*, 36-48. Quorum Books.
- Bass, B. M. 1981. *Stodgill's Handbook of Leadership*. New York: The Free Press.
- Bass, B. M., & Riggio, R. R. 2006. *Transformational Leadership* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Bauer, T. N., Erdogan, B., Liden, R. C., & Wayne, S. J. 2006. A longitudinal study of the moderating role of extraversion: Leader-member exchange, performance, and turnover during new executive development. *Journal of Applied Psychology*, 91: 298-310.
- Bauer, T. N., & Green, S. G. 1996. Development of leader-member exchange: a longitudinal test. *Academy of Management Journal*, 39: 1538-1567.
- Beehr, T. A. 1976. Perceived situational moderators of the relationship between role ambiguity and role strain. *Journal of Applied Psychology*, 61: 35-40.
- Berger, C. R., & Calbrese, R. J. 1975. Some explorations in initial interaction and beyond: Toward a development theory of interpersonal communication. *Human Communication Research*, 1: 99-112.
- Blau, G. 1993. Testing the relationship of locus of control to different performance dimensions. *Journal of Occupational and Organizational Psychology*, 66: 125-138.
- Bligh, M. C., & Meindl, J. R. 2005. The cultural ecology of leadership: an analysis of popular leadership books. In D. M. Messick, & R. M. Kramer, (Eds.), *The Psychology of Leadership*, 11-52. Mahwah, NJ: Lawrence Erlbaum Associates.
- Boies, K., & Howell, J. M. 2006. Leader-member exchange in teams: An examination of the interaction between relationship differentiation and mean LMX in explaining team-level outcomes. *Leadership Quarterly*, 17: 246-257.
- Bolger, N. 1990. Coping as a personality process: A prospective study. *Journal of Personality and Social Psychology*, 59: 525-537.
- Bolger, N., Davis, A., & Rafaeli, E. 2003. Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, 54: 579-616.
- Bono, J. E., & Judge, T. A. 2003. Core self-evaluations: A review of the trait and its role in job satisfaction and job performance. *European Journal of Personality*, 17: 5-18.
- Bono, J. E., & Judge, T. A. 2004. Personality and Transformational and transactional leadership: A meta-analysis. *Journal of Applied Psychology*, 89: 901-910.

-
- Boone, C., De Brabander, B. and van Witteloostuijn, A. 1996. CEO locus of control and small firm performance: An integrative framework and empirical test. *Journal of Management Studies*, 33: 667-699.
- Boone, C., van Olffen, W. and van Witteloostuijn, A. 2005. Team locus of control composition, leadership structure, information acquisition, and financial performance: A business simulation study. *Academy of Management Journal*, 48: 889-909.
- Brambor, T., Clark, W. R., & Golder, M. 2006. Understanding interaction models: improving empirical analysis. *Political Analysis*, 14: 63-82.
- Brenninkmeijer, V., & van Yperen, N. 2003. How to conduct research on burnout: Advantages and disadvantages of a unidimensional approach in burnout research. *Occupational and Environmental Medicine*, 60: 16-21.
- Brower, H. H., Schoorman, F. D., & Tan, H. H. 2000. A model of relational leadership: The integration of trust and leader-member exchange. *Leadership Quarterly*, 11: 227-250.
- Bryne, B. M. 1993. The Maslach Burnout Inventory: Testing for factorial validity and invariance across elementary, intermediate and secondary teachers. *Journal of Occupational and Organizational Psychology*, 66: 197-212.
- Burisch, M. 1993. Burnout: In search of theory: Some ruminations on the nature and etiology of burnout. In W. B. Schaufeli, C. Maslach, & T. Marek, (Eds.), *Professional Burnout. Recent Developments in Theory and Research*, 75-93. Philadelphia, PA: Taylor & Francis.
- Buunk, B. P. & Schaufeli, W. B. 1993. Burnout: A perspective from a social comparison theory. In W. B. Schaufeli, C. Maslach, & T. Marek, (Eds.), *Professional Burnout. Recent Developments in Theory and Research*, 53-69. Philadelphia, PA: Taylor & Francis.
- Cable, D. M., & Judge, T. A. 2003. Managers' upward influence tactic strategies: The role of manager personality and supervisor leadership style. *Journal of Organizational Behavior*, 24: 197-214.
- Cambell, K. S., White, C. D., & Johnson, D. E. 2003. Leader-member relations as a function of rapport management. *Journal of Business Communication*, 40: 170-194.
- Cashman, J., Dansereau, F., Graen, G., & Haga, W. J. 1976. Organizational understructure and leadership: a longitudinal investigation of the managerial role-making process. *Organizational Behavior and Human Performance*, 15: 278-296.
- Champoux, J. E., & Peters, W. S. 1987. Form, effect size and power in moderated regression analysis. *Journal of Occupational Psychology*, 60: 243-255.
- Chaplin, W. F. 1991. The next generation of moderator research in personality psychology. *Journal of Personality*, 59: 143-178.

- Chen, Z., Lam, W., & Zhang, J. A. 2007. Leader-member exchange and member performance: A new look at individual-level negative feedback-seeking behavior and team level empowerment climate. *Journal of Applied Psychology*, 92: 202-212.
- Cherniss, C. 1980. *Staff Burnout. Job Stress in the Human Services*. London: Sage.
- Cherniss, C. 1993. The role of professional self-efficacy in the etiology and amelioration of burnout. In W. B. Schaufeli, C. Maslach, & T. Marek, (Eds.). *Professional Burnout: Recent Developments in Theory and Research*, 135-149. Philadelphia, PA: Taylor & Francis.
- Chiaburu, D. S. 2005. The effects of instrumentality on the relationship between goal orientation and leader-member exchange. *The Journal of Social Psychology*, 145: 365-367.
- Chiu, C. K., Chien, C. S., Lin, C. P., & Hsiao, C. Y. 2005. Understanding hospital stress and turnover intentions in a practical setting. The moderating role of locus of control. *Journal of Management Development*, 24: 837-855.
- Chung, Y. Y., Ding, C. G. 2002. Development of the sales locus of control scale. *Journal of Occupational and Organizational Psychology*, 75: 233-245.
- Clarke, S. G., & Cooper, C. L. 2000. The risk management of occupational stress. *Health, Risk & Society*, 2: 173-187.
- Cleyman, K. L., Jex, S. M., & Love, K. G. 1995. Employee grievances: An application of the leader-member exchange model. *International Journal of Organizational Analysis*, 3: 156-174.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L.S. 2003. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* (3rd Ed.). New Jersey: Lawrence Erlbaum Associates.
- Cohrs, J. C., Abele, A. E., & Dette, D. E. 2006. Integrating situational and dispositional determinants of job satisfaction: Findings from three samples of professionals. *The Journal of Psychology*, 140: 363-395.
- Colquitt, J. A., Simmering, M. J. Conscientiousness, goal orientation, and motivation to learn during the learning process: A longitudinal study. *Journal of Applied Psychology*, 83: 654-665.
- Conger, J. A., & Kanungo, R. N. 1988. The empowerment process: Integrating theory and practice. *Academy of Management Review*, 13: 471-482.
- Connor-Smith, J. K., & Flachsbart, C. 2007. Relations between personality and coping: A meta-analysis. *Journal of Personality and Social Psychology*, 93: 1080-1107.
- Cooper, C. L., & Dewe, P. 2004. *A Brief History of Stress*. Oxford: Blackwell.
- Cooper, C. L. & Marshall, J. 1976. Occupational sources of stress: a review of the literature relating to coronary heart disease and mental ill-health. *Journal of Occupational Psychology*, 49: 11-28.
- Cordes, C. L., & Dougherty, T. W. 1993. A review and an integration of research on job burnout. *Academy of Management Review*, 18: 621-656.

-
- Cordes, C. L., Dougherty, T. W., & Blum, M. 1997. Patterns of burnout among managers and professionals: A comparison of models. *Journal of Organizational Behavior*, 18: 685-701.
- Costa, P. T., Busch, C. M., Zonderman, A. B., & McCrae, R. R. 1986. Correlations of MMPI factor scales with measures of the five factor model of personality. *Journal of Personality Assessment*, 50: 640-650.
- Costa, P. T., & McCrae, R. R. 1992. *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five Factor Inventory (NEO-FFI) Professional Manual*. Odessa, FL: Psychological Assessment Resources.
- Costa, P. T., McCrae, R. R., & Dye, D. A. 1991. Facet scales for agreeableness and conscientiousness: A revision of the NEO Personality Inventory. *Personality and Individual Differences*, 12: 887-898.
- Cox, T. 1978. *Stress*. London: MacMillan.
- Crampton, S. M., & Wagner, J. A. 1994. Report-percept inflation in micro-organizational research: An investigation of prevalence and effect. *Journal of Applied Psychology*, 79: 67-76.
- Cropanzano, R., Rupp, D. E., & Bryne, Z. S. 2003. The relationship of emotional exhaustion to work attitudes, job performance, and organizational citizenship behaviours. *Journal of Applied Psychology*, 88: 160-169.
- Daft, R. L., & Weick, K. E. 1984. Toward a model of organizations as interpreting systems. *Academy of Management Review*, 9: 284-295.
- van Dam, K., Oreg, S., & Schyns, B. 2008. Daily work contexts and resistance to organizational change: The role of leader-member exchange, development climate, and change process characteristics. *Applied Psychology: An International Review*, 57: 313-334.
- Daniels, K. 2001. Stress and emotion a new synthesis – a book review. *Human Relations*, 54: 792-803.
- Daniels, K., & Guppy, A. 1992. The dimensionality and well-being related correlates of work locus of control. *European Work and Organizational Psychologist*, 2: 319-330.
- Dansereau, F. 1995. A dyadic approach to leadership: Creating and nurturing this approach under fire. *Leadership Quarterly*, 6: 479-490.
- Dansereau, F., Graen, G., & Haga, W. J. 1975. A vertical dyad linkage approach to leadership within formal organizations. A Longitudinal investigation of the role making process. *Organizational Behavior and Human Performance*, 3: 46-78.
- Davis, W. D., & Gardner, W. L. 2004. Perceptions of politics and organizational cynicism: An attributional and leader-member exchange perspective. *Leadership Quarterly*, 15: 439-465.
- Deary, I. J., Blenkin, H., Agius, R. M., Endler, N. S., Zeally, H., & Wood, R. 1996. Models of job-related stress and personal achievement among consultant doctors. *British Journal of Psychology*, 87: 3-29.

- Deary, I. J., Watson, R., & Hogston, R. 2003. A longitudinal cohort study of burnout and attrition in nursing students. *Journal of Advanced Nursing*, 43:71-81.
- Deluga, R. J. 1994. Supervisor trust building, leader-member exchange and organizational citizenship behaviour. *Journal of Occupational and Organizational Psychology*, 67: 315-326.
- Deluga, R. J., & Perry, J. T. 1991. The relationship of subordinate upward influencing behaviour, satisfaction and perceived superior effectiveness with leader member exchanges. *Journal of Occupational Psychology*, 64: 239-252.
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. 2001. The job demands-resource model of burnout. *Journal of Applied Psychology*, 86: 499-512.
- Demise, N. 2005. Business ethics and corporate governance in Japan. *Business and Society*, 44: 211-217.
- Densten, I. L. 2001. Re-thinking burnout. *Journal of Organizational Behaviour*, 22: 833-847.
- Densten, I. L. 2005. The relationship between visioning behaviours of leaders and follower burnout. *British Journal of Management*, 16: 105-118.
- Department for Children, Schools and Families. 2005. *Teenage Pregnancy Data & Analysis Toolkit*, October 2005: 1-7. Retrieved from <http://www.everychildmatters.gov.uk/health/teenagepregnancy/statistics/>
- Department for Education and Skills. 2006. *Teenage pregnancy next steps: Guidance for local authorities and primary care trusts on effective delivery of local strategies*, July 2006: 1-68. DfES Publications: Nottingham. Retrieved from: <http://www.dh.gov.uk/en/Policyandguidance/Healthandsocialcaretopics/TeenagePregnancy/index.htm>
- Dienesch, R. M., & Liden, R. C. 1986. Leader-member exchange model of leadership: A critique and further development. *Academy of Management Review*, 11: 618-634.
- van Dierendonck, D., Hayes, C., Borrill, C., & Stride, C. 2004. Leadership behavior and subordinate well-being. *Journal of Occupational Health Psychology*, 9: 165-175.
- Duchon, D., Green, S. G., Taber, T. D. 1986. Vertical dyadic linkage: A longitudinal assessment of antecedents, measures, and consequences. *Journal of Applied Psychology*, 71: 56-60.
- Dunegan, K. J., Duchon, D., & Uhl-Bien, M. 1992. Examining the link between Leader-member exchange and subordinate performance: The role of task analyzability and variety as moderators. *Journal of Management*, 18: 59-76.
- Dunegan, K. J., Uhl-Bien, M., & Duchon, D. 2002. LMX and subordinate performance: The moderating effects of task characteristics. *Journal of Business and Psychology*, 17: 275-285.
- Dunn, W. S., Mount, M. K., Barrick, M. R., & Ones, D. S. 1995. Relative importance of personality and general mental ability in managers' judgments of applicants qualifications. *Journal of Applied Psychology*, 80: 500-509.

-
- Durand, D. E., & Nord, W. R. 1976. Perceived leader behavior as a function of personality characteristics of supervisors and subordinates. *Academy of Management Journal*, 19: 427-438.
- Eden, D., & Kinnar, J. 1991. Modelling Galatea: Boosting self-efficacy to increase volunteering. *Journal of Applied Psychology*, 76: 770-780.
- Eden, D., & Zuk, Y. 1995. Seasickness as a self-fulfilling prophecy: Raising self-efficacy to boost performance at sea. *Journal of Applied Psychology*, 80: 628-635.
- Ehrhart, M. G., & Klein, K. J. 2001. Predicting followers' preferences for charismatic leadership: the influence of follower values and personality. *Leadership Quarterly*, 12: 153-179.
- Engle, E. M., & Lord, R. G. 1997. Implicit theories, self-schemas, and leader-member exchange. *Academy of Management Journal*, 40: 988-1010.
- Epitropaki, O., & Martin, R. 2005. From ideal to real: A longitudinal study of the role of implicit leadership theories on leader-member exchanges and employee outcomes. *Journal of Applied Psychology*, 90: 659-676.
- Erdogan, B., Kraimer, M. L., Liden, R. C. 2004. Work value congruence and intrinsic career success: the compensatory roles of leader-member exchange and perceived organizational support. *Personnel Psychology*, 57: 305-332.
- Erdogan, B., L., Liden, R. C., & Kraimer, M. 2006. Justice and leader-member exchange: The moderating role of organizational culture. *Academy of Management Journal*, 49: 395-406.
- Erez, A., & Judge, T. A. 2001. Relationship of core self-evaluations to goal setting, motivation and performance. *Journal of Applied Psychology*, 86: 1270-1279.
- Fairhurst, G. T. 1993. The leader-member exchange patterns of women leaders in industry: A discourse analysis. *Communication Monographs*, 60: 321-351.
- Fairhurst, G. T., & Chandler, T. A. 1989. Social structures in leader-member interaction. *Communication Monographs*, 56: 215-239.
- Fairhurst, G. T., Rogers, L. E., & Sarr, R. A. 1987. Manager-subordinate control patterns and judgments about the relationship. *Communication Yearbook*, 10: 395-415.
- Felfe, J. & Schyns, B. 2006. Personality and the perception of transformational leadership: The impact of extraversion, neuroticism, personal need for structure and occupational self-efficacy. *Journal of Applied Social Psychology*, 36: 708-739.
- Fenlason, K. J., & Beehr, T. A. 1994. Social support and occupational stress: Effects of talking to others. *Journal of Organizational Behavior*, 15: 157-175.
- Fisher, C. 1980. On the dubious wisdom of expecting job satisfaction to correlate with performance. *Academy of Management Review*, 5: 607-612.
- Flynn, F. J., Chatman, J. A., & Spataro, S. E. 2001. Getting to know you: The influence of personality on impressions and performance of demographically different people in organizations. *Administrative Science Quarterly*, 46: 414-442.

- Folkman, S., & Lazarus, R. S. 1988. The relationship between coping and emotion: Implications for theory and research. *Social Science in Medicine*, 26: 309-317.
- Francis, L. J., Louden, S. H., & Rutledge, C. J. F. 2004. Burnout among Roman Catholic parochial clergy in England and Wales: Myth or reality? *Review of Religious Research*, 46: 5-19.
- Frazier, P. A., Tix, A. P., & Barron, K. E. 2004. Testing of moderator and mediator effects in counselling psychology. *Journal of Counselling Psychology*, 51: 115-134.
- Freudenberger, H. J. 1974. Staff burn-out. *Journal of Social Issues*, 30: 159-165.
- Freudenberger, H. J., & Richelson, G. 1980. *Burnout. The High Cost of Success and How to Cope With it*. London: Arrow Books.
- Furnham, A., & Drakeley, R. J. 1993. Work locus of control and perceived organizational climate. *European Work and Organizational Psychologist*, 3: 1-9.
- Furnham, A., & Steele, H. 1993. Measuring locus of control: A critique of general, children's, health- and work-related locus of control questionnaires. *British Journal of Psychology*, 84: 443-479.
- Fusilier, M. R., Ganster, D. C., & Mayes, B. T. 1987. Effects of social support, role stress, and locus of control on health. *Journal of Management*, 13: 517-528.
- Gabis, G. T., & Ihrke, D. M. 1996. Burnout in a large federal agency: Phase model implications for how employees perceive leadership credibility. *Public Administration Quarterly*, Summer: 220-249.
- Gable, M., & Dangello, F. 1994. Locus of control, Machiavellianism, and managerial job performance. *Journal of Psychology*, 128: 599-608.
- Ganster, D. C., Fusilier, M. R., & Mayes, B. T. 1986. Role of social support in the experience of stress at work. *Journal of Applied Psychology*, 71: 102-110.
- Ganster, D., & Schaubroeck, J. 1991. Work stress and employee health. *Journal of Management*, 17: 235-271.
- George, J. M., Brief, A. P. 2004. Personality and work-related distress. In B. Schneider, & D. B. Smith, (Eds.), *Personality and Organization*, 193-219. Mahwah, NJ: Lawrence Erlbaum Associates.
- Gerstner, C. R., & Day, D. V. 1997. Meta-analytical review of leader-member exchange theory: Correlates and construct issues. *Journal of Applied Psychology*, 82: 827-844.
- Gillespie, D. F., & Numerof, R. E. 1984. *The Gillespie-Numerof Burnout Inventory: Technical Manual*. St. Louis: Washington University.
- Gist, M. E. 1989. The influence of training method on self-efficacy and idea generation among managers. *Personnel Psychology*, 42: 787-805.
- Gist, M. E., & Mitchell, T. R. 1992. Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, 2: 183-211.
- Goldberg, L. R. 1992. The development of markers for the Big-Five factor structure. *Psychological Assessment*, 4: 26-42.

-
- Golembiewski, R. T., & Munzenrider, R. 1981. Efficacy of three versions of one burnout measure: MBI as total score, sub-scale scores or phases? *Journal of Health and Human Resources Administration*, 4: 228-246.
- Graen, G. B., & Novac, M. A., & Sommerkamp, P. 1982. The effects of leader-member exchange and job design on productivity and satisfaction: Testing a dual attachment model. *Organizational Behavior and Human Performance*, 30: 109-131.
- Graen, G. B., & Uhl-Bien, M. 1995. Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *Leadership Quarterly*, 6: 219-247.
- Greguras, G. J., & Ford, J. M. 2006. An examination of the multidimensionality of supervisor and subordinate perceptions of leader-member exchange. *Journal of Occupational and Organizational Psychology*, 79: 433-465.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. 2006. *Multivariate Data Analysis* (6th ed.). Upper Saddle River: NJ: Pearson.
- Hakanen, J. B., Bakker, A. B., & Schaufeli, W. B. 2006. Burnout and work engagement among teachers. *Journal of School Psychology*, 43: 495-513.
- Halbesleben, J. R. B. 2006. Sources of social support and burnout: A meta-analytical test of the conservation of resources model. *Journal of Applied Psychology*, 91: 1134-1145.
- Halbesleben, J. R. B., & Bowler, W. M. 2007. Emotional exhaustion and job performance: The mediating role of motivation. *Journal of Applied Psychology*, 92: 93-106.
- Halbesleben, J. R. B., & Buckley, M. R. 2004. Burnout in organizational life. *Journal of Management*, 30: 859-879.
- Harris, K. J., & Kacmar, K. M. 2005. Easing the strain: The buffer role of supervisors in the perceptions of politics-strain relationship. *Journal of Occupational and Organizational Psychology*, 78: 337-354.
- Harris, K. J., & Kacmar, K. M. 2006. Too much of a good thing: The curvilinear effect of leader-member exchange on stress. *Journal of Social Psychology*, 146: 65-84.
- Harrison, D. A., McLaughlin, M. E., & Coalter, T. M. 1996. Context, cognition and common-method variance: Psychometric and verbal protocol evidence, *Organizational Behavior and Human Decision Processes*, 68: 246-261.
- Hetland, H., Sandal, G. M., & Johnsen, T. B. 2007. Burnout in the information technology sector: Does leadership matter? *European Journal of Organizational Psychology*, 16: 58-75.
- Hiers, J. M., & Heckel, R. V. 1977. Seating choice, leadership, and locus of control. *Journal of Social Psychology*, 103: 313-314.
- Hobfoll, S. E. 1989. Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44: 513-524.

- Hobfoll, S. E. 2001. The influence of culture, community, and the nested self in the stress process: Advancing conservation of resources theory. *Applied Psychology: An International Review*, 50: 337-370.
- Hobfoll, S. E., & Freedy, J. 1993. Conservation of resources: A general stress theory applied to burnout. In W. B. Schaufeli, C. A. Maslach, T. Marek, (Eds.). *Professional Burnout: Recent Developments in Theory and Research*, 115-129. Philadelphia, PA: Taylor & Francis.
- Hochwarter, W. A., Witt, L. A., & Kacmar, K. M. 2000. Perceptions of organizational politics as a moderator of the relationship between conscientiousness and job performance. *Journal of Applied Psychology*, 85: 472-478.
- Hodson, R., & Roscigno, V. J. 2004. Organizational success and worker dignity: complementary or contradictory? *American Journal of Sociology*, 110: 672-708.
- Hofmann, D. A. 1997. An overview of the logic and rationale of hierarchical linear models. *Journal of Management*, 23, 723-744.
- Hofmann, D. A., Morgeson, F. P., & Gerras, S. J. 2003. Climate as a moderator of the relationship between leader-member exchange and content specific citizenship: safety climate as an exemplar. *Journal of Applied Psychology*, 88: 170-178.
- Hogan, R. 2004. Personality psychology for organizational researchers. In B. Schneider, & D. B. Smith, (Eds.), *Personality and Organization*, 3-23. Mahwah, NJ: Lawrence Erlbaum Associates.
- Hogan, R., & Shelton, D. 1998. A socioanalytical perspective on job performance. *Human Performance*, 11: 129-144.
- Hosking, D. M. 1988. Organizing, leadership and skilful process. *Journal of Management Studies*, 25: 147-166.
- House, R. J., & Rizzo, J. R. 1972. Role conflict and ambiguity as critical variables in a model of organizational behavior. *Organizational Behavior and Human Performance*, 7: 467-505.
- Howell, J. M., & Avolio, B. J. 1993. Transformational leadership, and support for innovation: Key predictors of consolidated-business-unit performance. *Journal of Applied Psychology*, 78: 891-902.
- Howell, J. M., & Shea, C. M. 2001. Individual differences, environment scanning, innovation framing, and champion behavior: Key predictors of project performance. *Journal of Product Innovation Management*, 18: 15-27.
- Howell, J. M., & Shamir, B. 2005. The role of followers in the charismatic leadership process: Relationships and their consequences. *Academy of Management Review*, 30: 96-112.
- Hubbard, R., & Allen, S. J. 1987. An empirical comparison of alternative methods for principle component extraction. *Journal of Business Research*, 15: 173-190.
- Ilies, R., Nahrgang, J. D., & Morgeson, F. P. 2007. Leader-member exchange and citizenship behaviours: A meta-analysis. *Journal of Applied Psychology*, 92: 269-277.

-
- Jaccard, J., & Turrisi, R. 2003. *Interaction Effects in Multiple Regression - Second edition*. Sage Publications: Thousand Oaks.
- Jackson, S. E. 1983. Participation in decision making as a strategy for reducing job-related strain. *Journal of Applied Psychology*, 68: 3-19.
- Jackson, S. E., & Schuler, R. S. 1985. A meta-analysis and conceptual critique of research on role ambiguity and role conflict in work settings, *Organizational Behavior and Human Decision Processes*, 36: 16-78.
- Jackson, S. E., Turner, J. A., & Brief, A. P. 1987. Correlates of burnout among public service lawyers. *Journal of Occupational Behavior*, 8: 339-349.
- James, A. E. C., & Wright, P. L. 1993. Perceived locus of control: Occupational stress in the ambulance service. *Journal of Managerial Psychology*, 8: 3-8.
- Janssen, O., & van Yperen, N. W. 2004. Employees' goal orientations, the quality of leader-member exchange, and the outcomes of job performance and job satisfaction. *Academy of Management Journal*, 47: 368-384.
- Jerusalem, M., & Mittag, W. 1993. Self-efficacy in stressful life transitions. In A. Bandura, (Ed.), *Self-Efficacy in Changing Societies*, 177-201. Cambridge: Cambridge University Press.
- Jex, S., & Bliese, P. D. 1999. Efficacy beliefs as moderators of the impact of work-related stressors: A multilevel study. *Journal of Applied Psychology*, 84: 349-361.
- Jex, S., Bliese, P. D., Buzzell, S., & Primeau, J. 2001. The impact of self-efficacy on stressor-strain relations: Coping style as an exploratory mechanism. *Journal of Applied Psychology*, 86: 401-409.
- Jex, S. M., & Gudanowski, D. M. 1992. Efficacy beliefs and work stress: An exploratory study. *Journal of Organizational Behavior*, 13: 509-517.
- Johlke, M. C., & Duhan, D. F. 2001. Supervisor communication practices and boundary spanner role ambiguity. *Journal of Management Issues*, 13: 87-102.
- John, O. P., & Srivastava, S. 1999. The Big-Five taxonomy: History, measurement and theoretical perspectives. In L. Pervin & O. P. John (Eds.), *Handbook of Personality: Theory and Research*, (2nd ed.). 102-138. New York: Guilford.
- Johnson, A. L., Luthans, F., & Hennessey, H. W. 1984. The role of locus of control in leader influence behaviour. *Personnel Psychology*, 37: 61-75.
- Judge, T. A., & Bono, J. E. 2000. Five-factor model of personality and transformational leadership. *Journal of Applied Psychology*, 85: 751-765.
- Judge, T. A., & Bono, J. E. 2001. Relationship of core self-evaluations traits - self-esteem, generalized self-efficacy, locus of control, and emotional stability - with job satisfaction and job performance. *Journal of Applied Psychology*, 86: 80-92.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. 2002. Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87: 765-780.

- Judge, T. A., Bono, J. E., & Locke, E. A. 2000. Personality and job satisfaction: The mediating role of job characteristics. *Journal of Applied Psychology*, 85: 237-249.
- Judge, T. A., Erez, A., & Bono, J. E. 1998. The power of being positive: The relationship between positive self-concept and job performance. *Human Performance*, 11: 167-187.
- Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. 2003. The core self-evaluations scale: Development of a measure. *Personnel Psychology*, 56: 303-331.
- Judge, T. A., & Ilies, R. 2002. Relationship of personality to performance motivation: A meta-analytical review. *Journal of Applied Psychology*, 87: 797-807.
- Judge, T. A., van Vianen, A. E. M., & De Pater, I. E. 2004. Emotional stability, core self-evaluations, and job outcomes: A review of the evidence and an agenda for future research. *Human Performance*, 17: 325-346.
- Kacmar, K. M., Witt, L. A., Zivnuska, S., & Gully, S. M. 2003. The interactive effects of leader-member exchange and communication frequency on performance ratings. *Journal of Applied Psychology*, 88: 764-772.
- Kahill, S. 1988. Symptoms of Burnout. A review of the empirical evidence. *Canadian Psychology*, 29: 284-297.
- Kalbers, L. P., & Fogarty, T. J. 2005. Antecedents to internal auditor burnout. *Journal of Managerial Issues*, 17: 101-118.
- Kalliath, T. J., O'Driscoll, M. P., Gillespie, D. F., & Bluedorn, A. C. 2000. A test of the Maslach Burnout Inventory in three samples of healthcare professionals. *Work & Stress*, 14: 35-50.
- Karasek, R. A. 1979. Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24: 285-308.
- Keller, T. and Dansereau, F. 1995. Leadership and empowerment: A social exchange perspective. *Human Relations*, 48: 127-146.
- Kemery, E. R., Mossholder, K. W., & Bedeian, A. G. 1987. Role stress, physical symptomatology, and turnover intentions: A causal analysis of three alternative specifications. *Journal of Occupational Behaviour*, 8: 11-23.
- Kinicki, A. J., & Vecchio, R. P. 1994. Influences on the quality of supervisor-subordinate relations: The role of time-pressure, organizational commitment, and locus of control. *Journal of Organizational Behavior*, 15: 75-82.
- Klien, H. J., & Kim, J. S. 1998. A field study of the influence of situational constraints, leader-member exchange, and goal commitment on performance. *Academy of Management Journal*, 41: 88-95.
- Koeske, G. F., Kirk, S. A., & Koeske, R. D. 1993. Coping with job stress: Which strategies work best? *Journal of Occupational and Organizational Psychology*, 66: 319-335.
- Kozlowski, S. W. J., & Doherty, M. L. 1989. Integration of climate and leadership: Examination of a neglected issue. *Journal of Applied Psychology*, 74: 546-553.

-
- Kramer, M. V. 1995. A longitudinal study of superior-subordinate communication during job transfers. *Human Communication Research*, 22: 39-64.
- Kramer, M. W. 2004. The complexity of communication in leader-member exchanges. In G. B. Graen, (Ed.), *New Frontiers of Leadership*, 167-191. Greenwich, Connecticut: Information Age Publishing.
- Kramer, M. V., Dougherty, D. S., & Pierce, T. A. 2004. Managing uncertainty during a corporate acquisition: A longitudinal study of communication during an airline acquisition. *Human Communication Research*, 30: 71-101.
- Kupers, W. 2007. Perspectives on integrating leadership and followership. *International Journal of Leadership Studies*, 2: 194-221.
- Lagace, R. R., Castleberry, S. B., & Ridnour, R. E. 1993. An exploratory sales force study of the relationship between leader-member exchange and motivation, role stress, and manager evaluation. *Journal of Applied Business Research*, 9: 110-119.
- Lam, W., Huang, X., & Snape, E. 2007. Feedback-seeking behaviour and leader-member exchange: Do supervisor-attributed motives matter? *Academy of Management Journal*, 50: 348-363.
- Lange, R. V., & Tiggemann, M. 1981. Dimensionality and reliability of the Rotter I-E locus of control scale. *Journal of Personality Assessment*, 45: 398-406.
- Lapierre, L. M., & Hackett, R. D. 2007. Trait conscientiousness, leader-member exchange, job satisfaction and organizational citizenship behaviour: A test of an integrative model. *Journal of Occupational and Organizational Psychology*, 80: 539-554.
- Lazarus, R. S. 2006. *Stress and Emotion*. New York: Springer Publishing Company.
- Lazarus, R. S. & Folkman, S. 1984. *Stress, Appraisal and Coping*. New York: Springer Publishing Company.
- Lee, J. 2001. Leader-member exchange, perceived organizational justice, and cooperative communication. *Management Communication Quarterly*, 14: 574-589.
- Lee, R. T., & Ashforth, B. E. 1990. On the meaning of Maslach's three dimensions of burnout. *Journal of Applied Psychology*, 75: 743-747.
- Lee, R. T., & Ashforth, B. E. 1993. A further examination of managerial burnout: Toward an integrated model. *Journal of Organizational Behavior*, 14: 3-20.
- Lee, R. T., & Ashforth, B. E. 1996. A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology*, 81: 123-133.
- Lefcourt, H. M. 1976. *Locus of Control. Current Trends in Theory & Research*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Leiter, M. P. 1991. Coping patterns as predictors of burnout. *Journal of Organizational Behavior*, 12: 123-144.
- Leiter, M. P. 1993. Burnout as a development process: Consideration of models. In W. B. Schaufeli, C. Maslach, & T. Marek, (Eds.), *Professional Burnout: Recent*

- Developments in Theory and Research*, (237-250). Philadelphia, PA: Taylor & Francis.
- Leiter, M. P., & Maslach, C. A. 1988. The impact of interpersonal environment on burnout and organizational commitment. *Journal of Organizational Behavior*, 9: 297-308.
- Leiter, M. P., & Maslach, C. A. 2005. *Banishing Burnout. Six Strategies for Improving Your Relationship with Work*. San Francisco: Jossey-Bass.
- LePine, J. A., LePine, M. A., & Jackson, C. L. 2004. Challenge and hindrance stress: Relationships with exhaustion, motivation to learn and learning performance. *Journal of Applied Psychology*, 89: 883-891.
- Levinson, H. 1980. Power, leadership, and the management of stress. *Professional Psychology*, 11: 497-508.
- Liden, R. C., Bauer, T. N., & Erdogan, B. 2004. The role of leader-member exchange in the dynamic relationship between employer and employee: Implications for employee socialization, leaders, and organizations. In J. A-M. Coyle-Shapiro, L. M. Shore, M. S. Taylor, & L. E. Tetrick, (Eds.), *The Employment Relationship. Examining Psychological and Contextual Perspectives*, 226-250. Oxford: Oxford University Press.
- Liden, R. C., & Graen, G. 1980. Generalizability of the vertical dyad linkage model of leadership. *Academy of Management Journal*, 23: 451-465.
- Liden, R. C., & Maslyn, J. M. 1998. Multidimensionality of leader-member exchange: An empirical assessment through scale development. *Journal of Management*, 24: 43-72.
- Liden, R. C., Wayne, S. J., & Stilwell, D. 1993. A longitudinal study on the early development of leader-member exchanges. *Journal of Applied Psychology*, 78: 662-674.
- Lindell, M. K., & Whitney, D. J. 2001. Accounting for common-method variance in cross-sectional research designs. *Journal of Applied Psychology*, 86: 114-121.
- Litt, M. D. Self-efficacy and perceived control: Cognitive mediators of pain tolerance. *Journal of Personality and Social Psychology*, 54: 149-160.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. 2002. A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7: 83-104.
- Maddux, J. E. 1995. Self-efficacy theory, In J. E. Maddux, (Ed.), *Self-Efficacy, Adaptation, and Adjustment. Theory Research and Application*, 3-33. New York: Plenum Press.
- Maddux, J. E., & Lewis, J. 1995. Self-efficacy and adjustment: Basic principles and issues, In J. E. Maddux, (Ed.), *Self-Efficacy, Adaptation, and Adjustment. Theory Research and Application*, 37-68. New York: Plenum Press.

-
- Maddux, J. E., & Meier, L. J. 1995. Self-efficacy and depression, In J. E. Maddux, (Ed.), *Self-Efficacy, Adaptation, and Adjustment. Theory Research and Application*, 143-169. New York: Plenum Press.
- Martin, R., Thomas, G., Charles, K., Epitropaki, O., & McNamara, R. 2005. The role of Leader Member Exchanges in mediating the relationship between locus of control and work reactions. *Journal of Occupational and Organizational Psychology*, 78: 141-147.
- Martocchio, J. J., & Judge, T. 1997. Relationship between conscientiousness and learning in employee training: Mediating influences of self-deception and self-efficacy. *Journal of Applied Psychology*, 82: 764-773.
- Maslach, C. A. 1982. *Burnout: The Cost of Caring*. Englewood Cliffs, NJ: Prentice Hall.
- Maslach, C. A. 1993. Burnout: A multidimensional perspective. In W. B. Schaufeli, C. Maslach, & T. Marek, (Eds.), *Professional Burnout. Recent Developments in Theory and Research*, 19-32. Philadelphia, PA: Taylor & Francis.
- Maslach, C. A. 2003. *Burnout: The Cost of Caring*. Englewood Cliffs, NJ: Prentice Hall.
- Maslach, C. A., & Jackson, S. E. 1981. The measurement of experienced burnout. *Journal of Occupational Behavior*, 2: 99-113.
- Maslach, C. A., Jackson, S. E., & Leiter, M. 1996. *Maslach Burnout Inventory. Manual (3rd ed)*. Palo Alto, CA: Consulting Psychologists Press.
- Maslach, C. A., & Leiter, M. P. 1997. *The Truth About Burnout: How Organizations Cause Personal Stress and What to Do About It*, San Francisco: Jossey-Bass.
- Maslach, C. A., & Schaufeli, W. B. 1993. Historical and conceptual development of burnout. In W. B. Schaufeli, C. Maslach, & T. Marek, (Eds.), *Professional Burnout. Recent Developments in Theory and Research*, 1-16. Philadelphia, PA: Taylor & Francis.
- Maslach, C. A., Schaufeli, W. B., & Leiter, M. P. 2001. Job burnout. *Annual Review of Psychology*, 52: 397-422.
- Maslach, J. M., & Uhl-Bien, M. 2001. Leader-member exchange and its dimensions: Effects of self-effort and other's effort on relationship quality. *Journal of Applied Psychology*, 86: 697-708.
- Mazur, P. J., & Lynch, M. D. 1989. Differential impact of administrative, organizational, and personality factors on teacher burnout. *Teaching and Teacher Education*, 5:337-353.
- McAllister, D. J. 1995. Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal*, 38: 24-59.
- McCrae, R. R., & Costa, P. T. 1986. Personality, coping, and coping effectiveness in an adult sample. *Journal of Personality*, 54: 385-405.

- McNatt, D. B., & Judge, T. A. 2004. Boundary conditions of the Galatea effect: A field experiment and constructive replication. *Academy of Management Journal*, 47: 550-565.
- Meek, B. C. 2004. The dark side of Japanese management in the 1990s: Karoshi and ijime in the work place. *Journal of Managerial Psychology*, 19: 312-331.
- Meindl, J. R. 1995. The romance of leadership as a follower-centric theory: A social constructionist approach. *Leadership Quarterly*, 6: 329-341.
- Meier, S.T. 1984. The construct validity of burnout. *Journal of Occupational Psychology*, 57: 211-219.
- Miller, D., & Toulouse, J. 1986. Chief executive personality and corporate strategy and structure in small firms, *Management Science*, 32: 1389-1409.
- Mitchell, T. R., Hopper, H., Daniels, D., George-Falvy, J., & James, L. R. 1994. Predicting self-efficacy and performance during skills acquisition. *Journal of Applied Psychology*, 79: 506-517.
- Mitchell, T. R., Smyser, C. M., & Weed, S. E. 1975. Locus of control: Supervision and work satisfaction. *Academy of Management Journal*, 18: 623-631.
- Moore, J. E. 2000. Why is this happening? A causal attribution approach to emotional exhaustion consequences. *Academy of Management Review*, 25: 335-349.
- Moorman, R. H., & Podsakoff, P. M. 1992. A meta-analytical review and empirical test of the potential confounding effects of social desirability response sets in organizational behavioural research. *Journal of Occupational and Organizational Psychology*, 65: 131-149.
- Morrison, E. W. 1993. Newcomer information seeking: Exploring types, modes, sources, and outcomes. *Academy of Management Journal*, 36: 557-589.
- Mount, M. K., Barrick, M. R., Scullen, S. M. & Rounds, J. 2005. Higher order dimensions of the big five personality traits and the big six vocational interest types. *Personnel Psychology*, 58: 447-478.
- Mueller, B. H., & Lee, J. 2002. Leader-member exchange and organizational communication satisfaction in multiple contexts. *Journal of Business Communication*, 39: 220-244.
- Murphy, S. E., & Ensher, E. A. 1999. The effect of leader and subordinate characteristics in the development of leader-member exchange quality. *Journal of Applied Social Psychology*, 29: 1371-1394.
- Nelson, D., Basu, R., & Purdie, R. 1998. An examination of exchange quality and work stressors in leader-follower dyads. *International Journal of Stress Management*, 5: 10-112.
- Neveu, J. 2007. Jailed resources: Conservation of resource theory as applied to burnout among prison guards. *Journal of Organizational Behavior*, 28: 21-42.
- Northouse, P. G. 2004. *Leadership Theory and Practice* (3rd ed.). Thousand Oaks: Sage.

-
- Ng, T. W. H., Sorensen, K. L., & Eby, L. T. 2006. Locus of control at work: a meta-analysis. *Journal of Organizational Behavior*, 27: 1057-1087.
- O'Brien, T. B., & DeLongis, A. 1996. The interactional context of problem-, emotion-, and relationship-focused coping: The role of the big five personality factors. *Journal of Personality*, 64: 775-813.
- O'Connor, W. E., & Morrison, T. G. 2001. A comparison of situational and dispositional predictors of perceptions of organizational politics. *Journal of Psychology*, 135: 301-312.
- O'Driscoll, M. P., & Beehr, T. A. 1994. Supervisor behaviours, role stressors and uncertainty as predictors of personal outcomes for subordinates. *Journal of Organizational Behavior*, 15: 141-155.
- O'Leary, A., & Brown, S. 1995. Self-efficacy and the psychological stress response. In J. E. Maddux, (Ed.), *Self-Efficacy, Adaptation, and Adjustment. Theory Research and Application*, 37-68. New York: Plenum Press.
- Oliver, J. E., Jose, P. E., & Brough, P. 2006. Confirmatory factor analysis of the work locus of control scale. *Educational and Psychology Measurement*, 66: 835-851.
- Ones, D. S., Viswesvaran, C., & Reiss, A. D. 1996. Role of social desirability in personality testing for personnel selection: The red herring. *Journal of Applied Psychology*, 81: 660-679.
- Pallant, J. 2006. *SPSS Survival Manual*. Berkshire: Open University Press.
- Palumbo, F. A., & Herbig, P. A. 1994. Salaryman sudden death syndrome. *Employee Relations*, 16: 54-61.
- Parker, S. K. 1998. Enhancing role breadth self-efficacy: The roles of job enrichment and other organizational interactions, *Journal of Applied Psychology*, 83: 835-652.
- Payne, R. 1991. Individual differences in cognition and the stress process. In C. L. Cooper & R. Payne, (Eds.), *Personality and Stress: Individual Differences in the Stress Process*, 180-201. Chichester: Wiley.
- Pearce, J. L. 1981. Bringing some clarity to role ambiguity research. *Academy of Management Review*, 6: 665-674.
- Phares, E. J. 1976. *Locus of Control in Personality*. Morristown, NJ: General Learning Press.
- Phillips, A. S., & Bedeian, A. G. 1994. Leader-follower exchange quality: The role of personal and interpersonal attributes. *Academy of Management Journal*, 37: 990-1001.
- Piccolo, R. F., & Colquitt, J. A. 2006. Transformational leadership and job behaviours: The mediating role of core job characteristics. *Academy of Management Journal*, 49: 327-340.
- Piedmont, R. L. 1993. A longitudinal analysis of burnout in a health care setting: The role of personal dispositions. *Journal of Personality Assessment*, 61: 457-473.

- Pines, A. M. 1993. Burnout: An existential perspective. In W. B. Schaufeli, C. Maslach, & T. Marek, (Eds.), *Professional Burnout. Recent Developments in Theory and Research*, 33-51. Philadelphia, PA: Taylor & Francis.
- Pines, A., & Aronson, E. 1988. *Career Burnout. Causes and Cures*. New York: Free Press.
- Pines, A., Aronson, E., & Kafry, D. 1981. *Burnout. From Tedium to Personal Growth*. New York: Free Press.
- Planlap, S., & Honeycutt, J. M. 1985. Events that increase uncertainty in personal relationships. *Human Communication Research*, 11: 593-604.
- Planlap, S., Rutherford, D. K., & Honeycutt, J. M. 1988. Events that increase uncertainty in personal relationships II. *Human Communication Research*, 14: 516-547.
- Podsakoff, P. M., MacKenzie, S. B., & Bommer, W. H. 1996. Transformational leader behaviors and substitutes for leadership as determinants of employee satisfaction, commitment, trust, and organizational citizenship behaviors. *Journal of Management*, 88: 879-903.
- Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. 1990. Transformational leader behaviors and their effects on followers' trust in leader, satisfaction and organizational citizenship behaviors. *Leadership Quarterly*, 1: 107-142.
- Podsakoff, P. M., MacKenzie, S. B., Podsakoff, N. P., & Lee, J. 2003. Common-method variance in behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88: 879-903.
- Podsakoff, P. M., & Organ, D. W. 1986. Self-reports in Organizational Research: Proposals and problems. *Journal of Management*, 12: 531-544.
- Pollock, K. 1988. On the nature of social stress: Production of a modern mythology. *Social Science and Medicine*, 26: 381-392.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments and Computers*, 36: 717-731.
- Preacher, K. J., & Hayes, A. F. (2007). SPSS and SAS Macros for Estimating and Comparing Indirect Effects in Multiple Mediator Models. Retrieved from <http://www.comm.ohio-state.edu/ahayes/SPSS%20programs/indirect.htm>
- Preacher, K. J., & Hayes, A. F. (in press). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*.
- Prussia, G. E., Anderson, J. S., & Manz, C. C. 1998. Self-leadership and performance outcomes: The mediating influence of self-efficacy. *Journal of Organizational Behavior*, 19: 523-538.
- Quick, J. & Quick, J. 1984. *Organizational Stress and Preventative Management*, New York: McGraw-Hill.

-
- Rafferty, Y., Friend, R., & Landsbergis, P. A. 2001. The association between job skill discretion, decision authority and burnout. *Work & Stress*, 15: 73-85.
- Raja, U., Johns, G., & Ntalianis, F. 2004. The impact of personality on psychological contracts. *Academy of Management Journal*, 47: 350-367.
- Ray, E. B. 1987. Supportive relationships and occupational stress in the work place. In T. L. Albrecht & M. B. Adelman, (Eds.), *Communicating Social Support*, 172-191. Newbury Park, CA: Sage.
- Redman, T., & Snape, E. 2002. Ageism in Teaching: Stereotypical Beliefs and Discriminatory Attitudes towards the Over-50s. *Work, Employment and Society*, 16: 355-371.
- Renn, R. W., & Fedor, D. B. 2001. Development and field test of a feedback seeking, self-efficacy, and goal setting model of work performance. *Journal of Management*, 27: 563-583.
- Richardson, A. M., & Martinussen, M. 2004. The Maslach Burnout Inventory: Factorial validity and consistency across occupational groups in Norway. *Journal of Occupational and Organizational Psychology*, 77: 377-384.
- Ringer, R. C., Boss, W. R. 2000. Hospital professionals' use of upwards influence tactics. *Journal of Management Issues*, 12: 92-109.
- Robertson, I. T., & Sadri, G. 1993. Managerial self-efficacy and managerial performance. *British Journal of Management*, 4: 37-45.
- Rotter, J. B. 1954. *Social Learning and Clinical Psychology*. Englewood Cliffs, NJ: Prentice Hall.
- Rotter, J. B. 1966. Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80: 1-28.
- Rousseau, D. M. 1989. Psychological and implied contracts in organizations. *Employee Responsibilities and Rights Journal*, 2: 121-139.
- Rousseau, D. M. 1995. *Psychological Contracts in Organizations: Understanding Written and Unwritten Agreements*. Newbury Park, CA: Sage.
- Russell, D. W., Altmaier, E., & van Velzen, D. 1987. Job-related stress, social support and burnout among classroom teachers. *Journal of Applied Psychology*, 72: 269-274.
- Salgado, J. F. 1997. The five factor model of personality and job performance in the European Community. *Journal of Applied Psychology*, 82: 30-43.
- Salgado, J. F. 1998. Big Five personality dimensions and job performance in army and civil occupations: A European perspective. *Human Performance*, 11: 271-288.
- Scandura, T. A., & Graen, G. B. 1984. Moderating effects of initial leader-member exchange status on the effects of a leadership intervention. *Journal of Applied Psychology*, 69: 428-436.
- Schaubroeck, J., Cotton, J. L., & Jennings, K. R. 1989. Antecedents and consequences of role stress: A covariance structural analysis.

- Schaubroeck, J., & Merritt, D. E. 1997. Divergent effects of job control on coping with work stressors: The key role of self-efficacy. *Academy of Management Journal*, 40: 738-754.
- Schaufeli, W. B., & Bakker, A. B. 2004. Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, 25: 293-315.
- Schaufeli, W. B., & van Dierendonck, D. 1993. The construct validity of two burnout measures. *Journal of Organizational Behavior*, 14: 631-647.
- Schaufeli, W. B., & Enzmann, D. 1998. *The Burnout Companion to Study and Practice: A Critical Analysis of Theory, Assessment, Research, and Interventions*, London: Taylor and Francis.
- Schaufeli, W. B., Enzmann, D., & Girault, N. 1993. Measurement of burnout: A review. In W. B. Schaufeli, C. Maslach, & T. Marek, (Eds.), *Professional Burnout. Recent Developments in Theory and Research*, 75-93. Philadelphia, PA: Taylor & Francis.
- Schaufeli, W. B., Leiter, M. P., Maslach, C., & Jackson, S. E. 1996. The Maslach Burnout Inventory – General Survey. In C. Maslach, S. E. Jackson, & M. P. Leiter (Eds.), *Maslach Burnout Inventory: Manual (3rd ed.)*, 19-26. Palo Alto, CA: Consulting Psychologists Press.
- Schaufeli, W. B., & Taris, J. W. 2005. The conceptualization and measurement of burnout: Common ground and worlds apart. *Work & Stress*, 19: 256-262.
- Schriesheim, C. A., Castro, S. L., & Cogliser, C. C. 1999. Leader-member exchange (LMX) research: A comprehensive review of theory, measurement, and data-analytic practices. *Leadership Quarterly*, 10: 63-113.
- Schriesheim, C. A., Neider, L. L., & Scandura, T. A. 1998. Delegation and leader-member exchange: Main effects, moderators, and measurement issues. *Academy of Management Journal*, 41: 298-318.
- Schyns, B. 2004. LMX in Germany: Theoretical and empirical reception of a dyadic leadership approach. In G. B. Graen, (Ed.), *New Frontiers of Leadership*, 139-165. Greenwich, Connecticut: Information Age Publishing.
- Schyns, B., & von Collani, G. 2002. A new occupational self-efficacy scale and its relation to personality constructs and organizational variables. *European Journal of Work and Organizational Psychology*, 11: 219-241.
- Schyns, B., & Croon, M. A. 2006. A model of task demands social structure, and leader-member exchange and their relationship to job satisfaction. *International Journal of Human Resource Management*, 17: 602-615.
- Schyns, B., & Paul, T., Mohr, G., & Blank, H. 2005. Comparing antecedents and consequences of leader-member exchange in a German working context to findings in the US. *European Journal of Work and Organizational Psychology*, 14: 1-22.

-
- Schyns, B., & Sanders, K. 2007. In the eyes of the beholder: Personality and the perceptions of leadership. *Journal of Applied Social Psychology*, 37: 2345-2363.
- Seltzer, J., & Numerof, R. E. 1988. Supervisory leadership and subordinate burnout. *Academy of Management Review*, 31: 439-446.
- Seltzer, J., Numerof, R. E., & Bass, B. M. 1989. Transformational leadership: Is it a source of more burnout and stress? *Journal of Health and Human Resource Administration*, 12: 174-185.
- Shirom, A. 1989. Burnout in work organizations. In C. L. Cooper & I. Robertson (Eds.). *International Review of Industrial-Organizational Psychology*, 25-48. New York: Wiley.
- Siu, O. L., Spector, P. E., Cooper, C. L., Lu, L., & Yu, S. 2002. Managerial stress in greater China: The direct and moderator effects of coping strategies and work locus of control. *Applied Psychology: An International Review*, 51: 608-632.
- Smith, M. A., & Canger, J. M. 2004. Effects of supervisor big-five personality on subordinate attitudes. *Journal of Business and Psychology*, 18: 465-481.
- Smith, M., & Cooper, C. 1994. Leadership and stress. *Leadership and Organizational Development Journal*, 15: 3-7.
- Social Exclusion Unit. 1999. *Teenage Pregnancy: Presented to Parliament by the Prime Minister by Command of Her Majesty*, Cm 4342: 1-139. London: The Stationery Office. Retrieved from:
<http://www.everychildmatters.gov.uk/health/teenagepregnancy/guidance/>
- Spangler, W. D., House, R. J., & Palrecha, R. 2004. Personality and leadership. In B. Schneider, & D. B. Smith, (Eds.), *Personality and Organization*, 251-290. Mahwah, NJ: Lawrence Erlbaum Associates.
- Sparrowe, R. T., & Liden, R. C. 1997. Process and structure in leader-member exchange. *Academy of Management Review*, 22: 522-552.
- Spector, P. E. 1987. Method variance as an artifact in self-reported affect and perceptions at work: myth or significant problem? *Journal of Applied Psychology*, 72: 438-443.
- Spector, P. E. 1988. Development of the work locus of control scale. *Journal of Occupational Psychology*, 61: 335-340.
- Spector, P. E. 2006. Method variance in organizational research. Truth of urban legend? *Organizational Research Methods*, 9: 221-232.
- Spector, P. E., Cooper, C. L., & Aguilar-Vafaie, M. E. 2002a. A comparative study of perceived job stressor sources and job strain in American and Iranian Managers. *Applied Psychology: An International Review*, 51: 446-457.
- Spector, P. E., Cooper, C. L., Sanchez, J. I., O'Driscoll, M., Sparks, K., Bernin, P., Bussing, A., De Moraes, F. R., Ostrognay, G. M., Radhakrishnan, P., Russinova, V., Salamatov, V., Salgado, J., Shima, S., Siu, O. L., Stora, J. B., Teichmann, M., Theodrell, T., Vlerick, P., Westman, M., Widerszal-Bazyl, M., Wong, P., & Yu, S. 2001. Do national levels of individualism and internal locus of control relate to

- well-being: an ecological level international study. *Journal of Organizational Behavior*, 22: 815-832.
- Spector, P. E., Cooper, C. L., Sanches, J. I., & Sparks, K., Bernin, K., Bussing, A., Dewe, P., Hart, P., Lu, Luo, Miller, K., Renault De Mores, L., Ostrognay, G. M., Pagon, M., Pitaria, H. D., Poelmans, S. A. Y., Radhakrishnan, P., Russinova, V., Salamatov, V., Salgado, J. F., Shima, S., Siu, O., Stora, J. B., Teichmann, M., Theorell, T., Vlerick, P., Westman, M., Widerszal-Bazyl, M., Wong, P. T. P., & Yu, S. 2002b. Locus of control and well-being at work: How generalizable are western findings? *Academy of Management Journal*, 45: 453-466.
- Spector, P. E., Sanchez, J. I., Siu, O. L., Salgado, J., Ma, J. 2004. Eastern versus western control beliefs at work: An investigation of secondary control, socioinstrumental control, and work locus of control in China and the US. *Applied Psychology: An International Review*, 53: 38-60.
- Speier, C., & Frese, M. 1997. Generalized self-efficacy as a mediator and moderator between control and complexity at work and personal initiative: A longitudinal field study in Eastern Germany. *Human Performance*, 10: 171-192.
- Srivastava, S. 2006. Measuring the big five personality factors. Retrieved from <http://www.uoregon.edu/~sanjay/bigfive.html>.
- Stajkovic, A. D., & Luthans, F. 1998. Self-efficacy and work related performance: A meta-analysis. *Psychological Bulletin*, 124: 240-261.
- Starek, J. E., & Keating, C. F. 1991. Self-deception and its relationship to success in competition. *Basic and Applied Social Psychology*, 12: 145-155.
- Steiner, D. D. 1997. Attributions in leader-member exchanges: Implications for practice. *European Journal of Work and Organizational Psychology*, 6: 59-71.
- Steptoe, A. 1991. Psychological coping, individual differences and psychological stress response. In C. L. Cooper & R. Payne, (Eds.), *Personality and Stress: Individual differences in the stress process*, 205-233. Chichester: Wiley.
- Stevens, J. P. 1984. Outliers and influential data points in regression analysis. *Psychological Bulletin*, 95: 334-344.
- Stewart, G. L., & Barrick, M. R. 2004. Four lessons learned from the person-situation debate: A review and research agenda. In B. Schneider, & D. B. Smith, (Eds.), *Personality and Organization*, 61-85. Mahwah, NJ: Lawrence Erlbaum Associates.
- Stordeur, S., D'hoore, W., & Vandenberghe, C. 2001. Leadership, organizational stress, and emotional exhaustion among hospital staff. *Journal of Advanced Nursing*, 35: 533-542.
- Storms, P. L., & Spector, P. E. 1987. Relationships of organizational frustration with reported behavioural reactions: The moderating effect of locus of control. *Journal of Occupational Psychology*. 60: 227-234.
- Strauss, E. 1994. *Dictionary of European Proverbs*. Routledge.

-
- Tabachnick, B. G. & Fidell, L. S. 2007. *Using Multivariate Statistics* (5th ed.). Boston: Pearson.
- Taris, T. W., Schreurs, P. J. G., & Schaufeli, W. B. 1999. Construct validity of the Maslach Burnout Inventory-General Survey: A two sample examination of its factor structure and correlates. *Work & Stress*, 13: 223-237.
- Teenage Pregnancy Unit. 2006. *Teenage Pregnancy: Working Towards 2010 Good Practice and Self-Assessment Toolkit*, October 2006: 1-49. Retrieved from <http://www.everychildmatters.gov.uk/teenagepregnancy/>
- Thomas, C. H. 2005. Preventing burnout: The effects of leader-member exchange and mentoring on socialization, role stress and burnout, *Academy of Management Proceedings*, C1-C6.
- Thomas, J. B., Clark, S. M., & Gioia, D. A. 1993. Strategic sensemaking and organizational performance: Linkages among scanning, interpretation, action, and outcomes. *Academy of Management Journal*, 36: 239-270.
- Thoms, P., Moore, K. S., & Scott, K. S. 1996. The relationship between self-efficacy for participating in self-managed work groups and the big five personality dimensions. *Journal of Organizational Behavior*, 17: 349-362.
- Thoresen, C. J., Bliese, P. D., Bradley, J. C., & Thoresen J. D. 2004. The big five personality traits and individual job performance growth trajectories in maintenance and transitional job stages. *Journal of Applied Psychology*, 89: 835-853.
- Uehata, T. 1990. *When the Corporate Warrior Dies*. Mado-sha, Tokyo.
- Vecchio, R. P., & Gobdel, B. C. 1984. The vertical dyad linkage model of leadership: Problems and prospects. *Organizational Behavior and Human Performance*, 34: 5-20.
- Walsh, W. B. 2004. Vocational psychology and personality. In B. Schneider, & D. B. Smith, (Eds.), *Personality and Organization*, 141-161. Mahwah, NJ: Lawrence Erlbaum Associates.
- Wanberg, C., 1997. Antecedents and outcomes of coping behaviours among unemployed and reemployed individuals. *Journal of Applied Psychology*, 82: 731-744.
- Wang, H., Law, K. S., Hackett, R. D., Wang, D., & Chen, Z. X. 2005. Leader-member exchange as a mediator of the relationship between transformational leadership and followers' performance and organizational citizenship behaviour. *Academy of Management Journal*, 48: 420-432.
- Watkins, M. W. 2000. *Monte Carlo PCA for Parallel Analysis* [computer software]. State College, PA: Ed & Psych Associates. Retrieved from <http://www.allenandunwin.com/spss2/further.htm>
- Watson, D., & Hubbard, B. 1996. Adaptational style and dispositional structure: Coping in the context of the Five Factor model. *Journal of Personality*, 64: 737-774.

- Watson, D., & Pennebaker, J. W. 1989. Health complaints, stress, and distress: Exploring the central role of negative affectivity. *Psychological Review*, 96: 234-254.
- Wayne, S. J. & Green, S. A. 1993. The effects of leader-member exchange on employee citizenship and impression management behaviour. *Human Relations*, 46: 1431-1440.
- Wayne, S. J., Liden, R. C., & Sparrowe, R. T. 1994. Developing leader-member exchanges. *American Behavioral Scientist*, 37: 697-714.
- Wayne, S. J., Shore, L. M., & Liden, R. C. 1997. Perceived organizational support and leader-member exchange: A social exchange perspective. *Academy of Management Journal*, 40: 82-111.
- Weiner, B. 1985. An attributional theory of achievement motivation and emotion. *Psychological Review*, 92: 548-573.
- Williams, S. L. 1995. Self-efficacy, anxiety, and phobic disorders. In J. E. Maddux, (Ed.), *Self-Efficacy, Adaptation, and Adjustment. Theory Research and Application*, 37-68. New York: Plenum Press.
- Williams, J. R., Miller, C. E., Steelman, L. A., & Levy, P.E. 1999. Increasing feedback seeking in public contexts: It takes two (or mere) to tango. *Journal of Applied Psychology*, 84: 969-976.
- Wood, R. & Bandura, A. 1989. Impact of conceptions of ability on self-regulatory mechanisms and complex decision making. *Journal of Personality and Social Psychology*, 56: 407-415.
- Wood, R., Bandura, A., & Bailey, T. 1990. Mechanisms governing organizational performance in complex decision-making environments. *Organizational Behavior and Human Decision Processes*, 46: 181-201.
- Wright, T. A., & Bonett, D. G. 1997. The contribution of burnout to work performance. *Journal of Organizational Behavior*, 18: 491-499.
- Wright, T. A., & Cropanzano, R. 1998. Emotional exhaustion as a predictor of job performance and voluntary turnover. *Journal of Applied Psychology*, 83: 486-493.
- Wright, T. A., & Cropanzano, R. 2000. Psychological well-being and job satisfaction as predictors of job performance. *Journal of Occupational Health Psychology*, 5: 84-94.
- Wright, T. A., & Hobfoll, S. E. 2004. Commitment, psychological well-being and job performance: An examination of conservation of resources (COR) theory and job burnout. *Journal of Business and Management*, 9: 389-406.
- Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. 2007. The role of personal resources in the job demands-resources model. *International Journal of Stress Management*, 14: 121-141.
- van Yperen, N. W., & Snijders, T. A. B. 2000. A multilevel analysis of the Job-Demand Control Model: Is stress at work determined by factors at the group level or the individual level? *Journal of Occupational Health Psychology*, 5: 182-190.

-
- Yrle, A. C., Hartman, S. J., & Galle, W. P. 2003. Examining communication style and leader-member exchange: considerations and concerns for managers. *International Journal of Management*, 20: 92-100.
- Yukl, G. 1989. Managerial Leadership: A review of theory and research, *Journal of Management*, 15: 251-289.
- Yukl, G. 2006. *Leadership in Organizations* (6th ed.). Upper saddle River, NJ: Pearson.
- Zellars, K. L., Perrewe, P. L., & Hochwarter, W. A. 2000. Burnout in health care: the role of the five factors of personality. *Journal of Applied Social Psychology*, 30: 1570-1598.
- Zwick, W. R., & Velicer, W. F. 1986. Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, 99: 432-442.

NEDERLANDSE SAMENVATTING (*Dutch summary*)

ACHTERGRONDEN EN DOELSTELLINGEN

Eerder onderzoek suggereert dat *burnout* op het werk veel voorkomt, met hoge kosten voor zowel organisaties als individuen. Deze kosten zijn op jaarbasis geschat op \$300 miljard voor de Verenigde Staten en £46 miljard voor het Verenigd Koninkrijk. In het licht van moderne arbeidsomstandigheden, die gepaard gaan met veel veranderingen en een oplopende werkdruk, is het waarschijnlijk dat deze kosten verder stijgen. Dat maakt de verantwoordelijkheid van managers, ook voor het welzijn van hun ondergeschikten, alleen maar groter. Hun leiderschap speelt een belangrijke rol bij het voorkomen van *burnout* op het werk. Ondanks de enorme aandacht voor leiderschap in de sociale wetenschappen is vooralsnog weinig bekend over het verband tussen de aard van de manager-werknemerrelatie en de kans op *burnout*, noch over de invloed van uiteenlopende leiderschapstijlen. Hetzelfde geldt voor de mate waarin de ontvankelijkheid voor *burnout* afhangt van de persoonlijkheid van de werknemer. In deze dissertatie wordt een aantal belangrijke aspecten van deze kwesties onder de loep genomen. Hierbij gaat de aandacht uit naar een selectie van factoren waarvan op theoretische gronden mag worden verwacht dat zij een belangrijke rol spelen bij het ontstaan van *burnout*: (1) beroepszelfvertrouwen, (2) werkvraag, (3) communicatiefrequentie, (4) leiderschapstijlen, en (5) werknemerpersoonlijkheid. In een reeks deelstudies is met behulp van regressie-analyses gepoogd stap voor stap de mogelijke verbanden te ontrafelen. Om dat mogelijk te maken is een vragenlijst afgenomen bij 128 middenmanagers in de Britse welzijnsector.

CONCEPTEN

Burnout

In 1982 publiceerde Maslach haar baanbrekende boek “Burnout: The Cost of Caring”. Daarin wordt *burnout* gedefinieerd als een multidimensioneel syndroom dat gepaard gaat met uitputting en dysfunctionele attitudes ten aanzien van het werk. *Burnout* wordt in het algemeen onderverdeeld in drie componenten: emotionele uitputting, depersonalisatie en gereduceerde prestaties.

Zelfvertrouwen

In de arbeidspsychologie wordt gewerkt met een specifieke vorm van zelfvertrouwen die van doen heeft met de persoonlijke perceptie van een individu terzake de mate waarin zij of hij denkt te beschikken over de capaciteiten om haar of zijn werk te organiseren en uit te voeren. Deze specifieke vorm van wat beroepszelfvertrouwen wordt genoemd, moet worden onderscheiden van het algemene gevoel van zelfvertrouwen. Vooral van de eerste vorm kan worden verwacht dat die samenhangt met de kans op *burnout*.

Leider-teamlidinteractie (LTI)

LTI-theorie is uniek vanwege de exclusieve nadruk die wordt gelegd op de paarsgewijze interactie tussen leidinggevende en ondergeschikte. De sleutelveronderstelling is dat de aard van deze interactie voor de ene ondergeschikte anders uitvalt dan voor de andere. Hoogwaardige interacties worden gekenmerkt door wederzijds vertrouwen, respect en gevoel van verantwoordelijkheid. Dat gaat gepaard met veel interactie en ondersteuning, alsmede formele en informele beloningen. Voor laagwaardige interacties geldt het omgekeerde.

Communicatiefrequentie

Communicatie is een kritische element van sociale steun die kan bijdragen aan de reductie van *stress* op de werkplek. De conventionele wijsheid is dat een hoger niveau van open communicatie is geassocieerd met positievere uitkomsten voor het individu. Managers besteden een- tot tweederde van hun tijd aan het communiceren met ondergeschikten.

Persoonlijkheid

In de moderne theorie van persoonlijkheid staan vijf trekken centraal, die bekend staan als de grote vijf: de mate waarin mensen (1) nauwgezet (2) neurotisch, (3) extravert, (4) gemoedelijk en (5) open zijn. De eerste twee zijn de belangrijkste in de context van succes op de werkplek. Een derde trek die belangrijk is gebleken is controlelocus. Deze drie zijn daarom in deze studie meegenomen:

1. De zes facetten van nauwgezetheid zijn competentie, orderlijkheid, plichtsbesef, prestatiedrang, zelfdiscipline en zorgvuldigheid.
2. De zes facetten van neuroticisme zijn angst, kwaadheid, depressiviteit, zelfbewustheid, impulsiviteit en kwetsbaarheid.
3. Controlelocus kan van extern tot intern variëren. Een individu kan minder (extern) of meer (intern) het gevoel hebben haar / zijn succes te kunnen beïnvloeden.

METHODOLOGIE

De relaties tussen deze concepten zijn onderzocht in een veldstudie onder 128 middenmanagers die werkzaam in de Britse welzijnsector met als verantwoordelijkheid in hun regio's het aantal ongewenste tienerzwangerschappen terug te brengen. De data zijn verzameld met behulp van een 'online'-vragenlijst en via de Britse Office of National Statistics. De vragenlijst bevat een reeks gevalideerde schalen waarmee de verschillende constructen zijn gemeten. De gebruikelijke psychometrische analyses maken duidelijk dat de metingen betrouwbaar en valide zijn. De data zijn vervolgens, na enkele noodzakelijke correcties en bewerkingen, geanalyseerd met behulp van hiërarchische multipele regressiemethoden.

BEVINDINGEN

Op basis van uitvoerig literatuuronderzoek en gerichte hypothesenontwikkeling is een reeks deelanalyses uitgevoerd. In deze samenvatting moet de opsomming beperkt blijven tot het volgende tiental bevindingen:

1. LTI is negatief gerelateerd met *burnout*, alsmede met de drie onderliggende componenten.
2. Communicatiefrequentie heeft een heuvelvormige relatie met *burnout*, met name emotionele uitputting. Het verband met depersonalisatie is positief, en dat met prestatiereductie insignificant, mits ook LTI in de modellen wordt opgenomen. In verfijndere modellen is een reeks interactie-effecten gevonden, waaruit blijkt dat het effect van communicatiefrequentie op (de componenten van) *burnout* afhangt van de kwaliteit van de LTI-relatie, alsmede de persoonlijkheid van de ondergeschikte.
3. LTI en communicatiefrequentie zijn beide positief gerelateerd met beroepszelfvertrouwen. Ook hier blijkt dat de precieze onderliggende relaties aanmerkelijk gecompliceerder zijn. Het effect van communicatiefrequentie op beroepszelfvertrouwen blijkt bijvoorbeeld volledig te lopen via de kwaliteit van de LTI-relatie.
4. Neuroticisme is positief gerelateerd met *burnout* en de onderliggende componenten. Het verband tussen nauwgezetheid en controlelocus enerzijds en *burnout* anderzijds is negatief. Neuroticisme is de belangrijkste trek ter verklaring van emotionele uitputting, terwijl controlelocus de belangrijkste trek is ter verklaring van depersonalisatie en prestatiereductie.
5. In lijn met de verwachting op basis van het zogenaamde werkvraagmodel is de werkvraag positief gerelateerd met emotionele uitputting, maar niet met depersonalisatie of prestatiereductie.
6. Controlelocus en werkvraag werken subtiel samen bij de verklaring van emotionele uitputting; hetzelfde geldt voor nauwgezetheid en neuroticisme bij de verklaring van de eendimensionele maat voor *burnout*. Hieruit blijkt dat persoonlijkheid een belangrijke rol speelt bij de omgang met werkdruk.
7. Alle drie de trekken zijn van invloed op beroepszelfvertrouwen. Nauwgezetheid en controlelocus hebben een positief effect, en neuroticisme heeft een negatieve impact. De complexe afhankelijkheden zijn weerspiegeld in een significante drieweginteractie.
8. Per saldo suggereren de resultaten dat persoonlijkheid een belangrijkere determinant van *burnout* en beroepszelfvertrouwen is dan leiderschap, met uitzondering van depersonalisatie. Voor een deel loopt de invloed indirect via een effect van de drie trekken op LTI. Dat geldt vooral voor nauwgezetheid, dat een heuvelvormig en vooral positief verband vertoont met LTI. Het effect van controlelocus is lineair positief, en dat van neuroticisme lineair negatief.

-
9. Beroepszelfvertrouwen is negatief gerelateerd met emotionele uitputting, prestatiereductie en de eendimensionele meting van *burnout*. Vooral de invloed op de eendimensionele meting van *burnout* is groot.
 10. Beroepszelfvertrouwen interacteert met vraagdruk in de verklaring van de eendimensionele meting van *burnout*. Een drieweginteractie tussen controlelocus, nauwgezetheid en beroepszelfvertrouwen is een determinant van emotionele uitputting en de eendimensionele meting van *burnout*.

In algemene zin laten de resultaten zien dat de verklaring van *burnout* en beroepszelfvertrouwen, alsmede de drie onderliggende componenten van *burnout*, gezocht moet worden in een complex en subtiel samenspel van de persoonlijkheid van de ondergeschikte, de relatie met de leidinggevende en de werkdruk.

CONCLUSIES

Generaliseerbaarheid

De vraag is in welke mate de bevindingen in deze studie kunnen worden generaliseerd. De middenmanagers in deze studie beschikken over verhoudingsgewijs veel autonomie, terwijl het werk wordt gekenmerkt door veel politiek gedrag. Uiteraard wijken deze omstandigheden af van die in veel andere werkcontexten. De relatie tussen persoonlijkheid en prestatie is meestal vooral krachtig in omstandigheden waarin van de omgeving ambigue signalen uitgaan, de autonomie van de ondergeschikte hoog is, en normatieve gedragsvoorschriften ontbreken. Omdat in deze veldstudie de werkeigenschappen hier niet mee in overeenstemming zijn, is het denkbaar dat het relatieve belang van persoonlijkheid groter en dat van leiderschap kleiner is dan in andere werkcontexten. Vervolgonderzoek in andere contexten ligt daarom voor de hand.

Sterkten en zwakten

Het veldkarakter is een sterkte van deze studie. Daarnaast bestaat de steekproef uit een homogene groep respondenten die allemaal met dezelfde werkvraag worden geconfronteerd. Een sterkte is ook dat deze werkvraag is gemeten met behulp van objectieve landelijke statistieken. Zoals elk onderzoek kent deze studie echter ook een aantal belangrijke beperkingen. Een viertal (potentiële) zwakten springt in het oog:

1. Behalve de werkvraag zijn alle variabelen gemeten met behulp van een vragenlijst die door één respondent is ingevuld. Daardoor ontstaat het gevaar van artificiële correlaties die alleen in de hoofden van de respondenten bestaan. Uitvoerige analyse van het bestand wijst overigens niet in deze richting. Dat is ook onwaarschijnlijk in het licht van de gevonden complexe verbanden.
2. Een tweede zwakte van deze studie is dat de leidinggevende niet rechtstreeks in het onderzoek is betrokken. In vervolgonderzoek zouden ook de percepties en persoonlijkheden van de leidinggevende moeten worden meegenomen.

3. De statistische kracht van deze studie is vrij laag vanwege de kleine steekproef van slechts 128 middenmanagers. Daardoor zijn verbanden mogelijk ten onrechte als insignificant geoordeeld. Omdat ten gevolge hiervan de toetsen conservatief zijn, vormt de kleine steekproefomvang overigens geen bedreiging voor de validiteit van de gevonden verbanden – integendeel.
4. De metingen in deze studie betreffen een doorsnede op één moment in de tijd. Daardoor is het onmogelijk causaliteiten te traceren. Een veldstudie met herhaalde metingen is aan te bevelen.

Toekomstig onderzoek

Hiervoor is een aantal suggesties voor toekomstig onderzoek gedaan, zoals replicatie in andere werkomstandigheden en in een longitudinale context, alsmede de meting van de perceptie en persoonlijkheid van leidinggevend. Daar kunnen nog een paar aanbevelingen aan worden toegevoegd. Allereerst kunnen andere persoonlijkheidstrekken worden onderzocht, inclusief de drie andere trekken van de grote vijf. Daarnaast kunnen de reactiestijlen op werkdruk worden bestudeerd.

ACKNOWLEDGEMENTS

This work would not have been possible without the help of many people a few of whom are mentioned here. First of all I would like to thank Prof. dr. Arjen van Witteloostuijn for his supervision of this Doctoral thesis. I am exceptionally grateful to Arjen and all he has done for me. Without his guidance, encouragement and support it would not have been possible for me to complete this work. I offer my sincere thanks to the members of my reading committee Prof. dr. J. P. Bahlmaan, Prof. dr. K. I. van Oudenhoven-van der Zee, Prof. dr. W. B. Schaufeli and Prof. dr. E. J. J. Schenk for reviewing this thesis. I am grateful to Mrs. Kathy Betteridge for her assistance with the collection of the data and the insights and explanation of the context she provided and I also thank Dr. Frits Wijbenga for the guidance he provided in my study of regression analysis. Finally, I acknowledge the valuable emotional support and resources provided by my wife Alison and our children Duncan and Jenny.

Leslie Graham
Durham, January 2009

CURRICULUM VITAE

Leslie (Les) Graham was born on 16th of March 1960 in Bebington, (UK). His first degree was in Engineering (BSc in Mechanical Engineering, University of the Witwatersrand). He has also been awarded an MBA (with distinction, Warwick University), a PGCERT (HE) (Durham University) and an MA in Business Research (Durham University). He has twenty-two years work experience in the automotive industry working for companies such as Dunlop, BTR, Sumitomo Rubber Industries and Magna Kansei Limited working in a variety of positions in engineering, manufacturing and general management. His last position in the automotive industry was Director and General Manager of Magna Kansei Limited a joint venture company between Magna of North America and Calsonic-Kansei of Japan. Achievements during this time include the award to plants that he was leading of a Nissan Motor Manufacturing UK Award in 1991 for “*Best Supplier – Quality*” and awards from Magna Automotive for “*Best Global Division*” in 2002 and “*Best New Product Launch*” in 2003. Leslie joined Durham Business School in 2003 as a teaching fellow. During his first two years, he received sponsorship and was appointed as a Fellow of the Foundation for Management Education. In 2005 he was promoted to Senior Teaching Fellow.