

## Midlife Concerns and Short-term Personality Change in Middle Adulthood

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### Abstract

*In this study, it was expected that personality change would be related to parents' concerns in various domains of midlife functioning. Personality was found to be moderately stable, but small but reliable change was also found. Fathers' change in personality was uniquely related to their life satisfaction, work stress and perceptions of the level of their adolescent children's internalising problems, but not to perceived partner support. By comparison, mothers' change in personality was only uniquely related to their life satisfaction. These results suggest that personality change in midlife is associated with the successful adaptation to midlife concerns. This pattern is consistent with social investment theories of personality development, though cross-lagged longitudinal research is needed to substantiate this conclusion. Copyright © 2006 John Wiley & Sons, Ltd.*

Key words: personality change; middle adulthood; midlife concerns; social investment theory

### INTRODUCTION

For a long time, it was thought that personality traits become essentially fixed by the age of 30 ('plaster hypothesis'; Costa & McCrae, 1994; James, 1890; McCrae & Costa, 1999). However, an extensive meta-analysis of *normative* (mean-level) change (Roberts, Walton, & Viechtbauer, 2006a) indicated that changes in most trait domains come close to one standard deviation throughout the entire life course and are not constrained to the adolescent or young adulthood period. Specifically, it has been observed that personality development across the life span is characterised by a pattern of maturation, evidenced by mean-level increases in emotional stability, conscientiousness and agreeableness (Costa, Herbst, McCrae, & Siegler, 2000). Second, a widely cited meta-analysis of *non-normative* (rank-order) change by Roberts and DelVecchio (2000) came to the conclusion that

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although personality stability increases with age, it never reaches unity, so personality change is possible across the entire life span. In the current paper, we investigate one possible correlate of such change: Adults' adaptation to midlife concerns.

As researchers increasingly agree on the position that personality development is characterised by both stability *and* change (Costa & McCrae, 2006), attention has now turned to the causes of personality change (Roberts, Walton, & Viechtbauer, 2006b; Terracciano, McCrae, Brant, & Costa, 2005). One perspective is that this maturation is governed by endogenous biological mechanisms unaffected by environmental influences (McCrae et al., 2000). An alternative position, which we take on in the current paper, is that personality change is the result of dynamic transactions between individual characteristics and the environment (Caspi, Roberts, & Shiner, 2005; Fraley & Roberts, 2005). It should be noted from the outset, however, that the design of the current study is not suited to carry out a stringent test to compare these two theoretical accounts.

How can contextual influences on personality be explained? According to Roberts, Wood, and Smith's (2005) Social Investment Theory, personality maturation during adulthood takes place as individuals assume and commit to adult social roles. According to this theory, taking on adult responsibilities in the domains of work, family, religion and volunteerism is associated with increases in conscientiousness, agreeableness and emotional stability. Because the timing of many of these adult roles is more-or-less age-graded in modern societies (e.g. onset of full-time employment, marriage, retirement), there exists a global time frame for this maturational process. However, there also exists individual variation in terms of deviations from this global time frame as well in the quality of these adaptations, which may constitute a source of individual differences in change. Likewise, changes in adult roles in the domain of work, family and parenthood may also affect personality change in middle adulthood, a possibility we will investigate in the current study.

## PERSONALITY CHANGE IN MIDDLE ADULTHOOD

According to Erikson (1950), middle-aged adults are faced with the developmental task of reaching out to the next generation (generativity) or remain locked in their individual lives (stagnation). According to a study by MacDermid and Crouter (1995), midlife concerns are quite broad and focus on work, marital relationships and child rearing. Although surprisingly little research has been conducted into the development of midlife careers (Greller & Stroh, 1995), it has been found that work becomes more autonomous, while at the same time adults acquire a more realistic look on their occupation and past achievements (Greller & Stroh, 1995; Koski & Steinberg, 1990). Reviewing the literature on marital relationships during midlife, Henry and Miller (2004) report that compared to other periods of the life span, marital satisfaction in middle adulthood is more dependent on shared values, commitment, and successful communication and decision-making. Finally, as children of middle-aged adults grow older and gradually become adults themselves, opportunities for parental control decrease (Koski & Steinberg, 1990). Instead, a study by Ryff, Lee, Essex, and Schmutte (1994) showed that midlife parents start evaluating how their children have turned out, and that parents who perceive their children as well-adjusted describe themselves as higher in well-being.

In contrast to the relatively large number of studies describing the shape of normative (mean-level) change during midlife (e.g. Helson, Jones, & Kwan, 2002; Jones, Livson, &

Peskin, 2003; Morizot & Le Blanc, 2003; Terracciano et al., 2005), there is a relative paucity of studies that address the correlates of non-normative change. Probably the most important exception is the work by Helson, Roberts, and their colleagues on the Mills Study of Women's Adult Development. Reporting on this sample, Roberts (1997) and Helson and Soto (2005) found that women who were more invested in their occupational careers showed a pattern of increasing personality maturation (e.g. they increased in agency and norm-adherence). Regarding this same age period, Roberts, Helson, and Klohnen (2002) reported that women who perceived more marital tensions and became mothers increased in femininity, whereas divorce was associated with decreases in dominance, and Roberts and Bogg (2004) found that investment in marriage was associated with increases in social responsibility (a facet of conscientiousness), whereas substance use was associated with decreases in this trait. Thus, these results are consistent with the Social Investment hypothesis that positive work and relationship experiences are related to personality maturation, though of course conclusions were based on a highly selected sample (educated women).

Besides the work by Helson, Roberts, and colleagues, only a selected number of other studies have looked at correlates of personality change in middle adulthood. Mroczek and Spiro (2003) followed 1600 men in their second life halves from the Normative Aging Study across a period of 12 years and found that marriage was associated with an above-average increase in emotional stability, whereas the death of a spouse was related to a momentary decrease followed by a recovery period in the years that followed this event. Costa et al. (2000) followed 2274 men and women in their 40s (retest interval 6–9 years), and found that participants who lost their job decreased in emotional stability and conscientiousness. The effects of divorce on personality change turned out to be gender specific, with associated increases in extraversion and openness for women and relative decreases in emotional stability and conscientiousness for men. Finally, using the same sample as the current study, Branje, van Lieshout, and van Aken (2004) found evidence for correlated changes between personality and perceptions of relational support, with the strongest associations for agreeableness and openness to experience. Overall, results are consistent with predictions of Social Investment Theory that the successful adaptation to normative social roles is related to personality change in the direction of greater social desirability.

A final note of consideration is the potentially moderating impact of gender on patterns of personality change in middle adulthood. For example, a longitudinal study by Clausen and Jones (1998) found that midlife men's personality is more influenced by work experiences, whereas women's personality is more influenced by family experiences. Also, recall that Costa et al. (2000) found quite different effects of divorce for men and women. Although Roberts and DelVecchio (2000); Roberts et al. (2006a) found no influence of gender on normative and non-normative personality change, it may still be that the specific influence on individuals' rank order position is different for men and women. Because of this, the current study investigates the correlates of personality change for men and women separately.

## THE PRESENT STUDY

To summarize, the current study will look into correlates of personality change in middle adulthood. Taking up a transactional perspective, we hypothesize that these changes are correlated with life experiences. Specifically, following Roberts et al. (2005) Social

Investment Theory, we predict that the successful adaptation to age-appropriate adult social roles (i.e. midlife concerns) is associated with greater personality maturation. For this purpose, we look into adaptation to the social roles of work, spouse and parent. Furthermore, we investigate how middle-aged adults' life satisfaction is related to personality change. Finally, we evaluate possible differences between men and women in the correlates of personality change.

## METHOD

### Participants

Participants were fathers and mothers recruited from the Family & Personality study, a longitudinal study of 288 Dutch two-parent families with two adolescents (Haselager & Van Aken, 1999). A representative selection of 23 municipalities in the Netherlands provided lists of families with two adolescents between the ages of 11 and 15 years. After a mailing to the families announcing the study, interviewers contacted the families by phone and invited them to participate. A total of 50% of the families contacted agreed to take part in the study. Only those families were included in the study in which all four members were willing to participate. Frequently given reasons for not wanting to participate were that the family had no interest in the topic of the project, or that a specific family member did not want to collaborate.

The average age was 43.9 years ( $SD = 3.27$ ) for the fathers and 41.7 years ( $SD = 3.71$ ) for the mothers. Almost all respondents (96%) were born in the Netherlands. A small proportion of the parents, 17% of the mothers and 19% of the fathers, had finished only primary or lower secondary education. Forty-six percent of the fathers and 28% of the mothers had finished an advanced technical or university education.

### Procedure

Families were followed over a period of 3 years, with yearly measurement waves. In each measurement wave, trained interviewers visited the families at home, and asked the mother, the father and each of the two target adolescents to fill out a battery of questionnaires. In the present study, both mothers' and fathers' self-reports on their Big Five personality collected in the first and the third wave are used, as well as self-reports on their life satisfaction and on the perceived support in the marital relationship collected in the second wave. The presence of the interviewer encouraged complete responding and prevented discussions regarding individual items or the topics in the questionnaires among the family members during completion of the questionnaires. Both adolescents in the family were given a CD gift certificate after completion of the questionnaires. Furthermore, a lottery was held in which 10 families that filled out all questionnaires were awarded a travel voucher (value of about 900) as a reward. This helped ensuring a high level of sample retention, as 285 of the 288 families continued their participation in the study throughout all measurement waves.

### Instruments

#### *Big five factors (Time 1 and 3)*

A Dutch adaptation (Gerris et al., 1998) of 30 adjective Big Five factors markers selected from Goldberg (1992) was used to have family members judge their own personalities and

the personalities of the other three participating family members. The participants rated the Big Five factors Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness to Experience using 30 adjectives along a seven-point Likert scale ranging from (1) *very untrue of this person* to (7) *very true of this person*. In the present study parent reports on their own personality characteristics were used. The internal consistencies (*Cronbach's alpha*) for the different Big Five factors rated in the two measurement waves ranged from 0.81 to 0.90 for fathers' self-ratings and from 0.80 to 0.90 for mothers' self-ratings. For both fathers and mothers, intercorrelations between the Big Five factors across the three waves were quite low, with an average value of 0.23 for fathers' self-ratings (ranging from 0.06 between emotional stability and conscientiousness to 0.36 between agreeableness and extraversion) and 0.19 for mothers' self-ratings (ranging from 0.01 between emotional stability and conscientiousness to 0.34 between extraversion and emotional and extraversion).

#### *Life satisfaction (Time 2)*

To measure global life satisfaction, the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffith, 1985) was used. The SWLS was developed to assess satisfaction with a participant's life as a whole. It does not assess satisfaction with specific life domains, but allows participants to integrate and weigh these domains in whatever way they choose (Pavot & Diener, 1993). The SWLS consists of five items (example: 'I am satisfied with my life') on which participants are asked to give rating on a 7-point scale (1 = strongly disagree, 7 = strongly agree). Earlier studies have shown the SWLS to have high internal consistency, high temporal reliability and high convergence with self- and peer-reported measures of subjective well-being and life satisfaction. In this study, the *Cronbach alpha* of the SWLS was 0.84 for fathers and 0.83 for mothers.

#### *Work stress (Time 2)*

Work stress was measured using a 13-item scale adapted from measures that focused on job-related affective well-being (Warr, 1990) and emotional exhaustion (Maslach & Jackson, 1984). Five items tapped job-related feelings of depression and pessimism (e.g. 'my job gives me a depressed feeling') and eight items tapped the degree to which work is emotionally draining (e.g. 'I find it difficult to unwind at the end of a workday'). Respondents rated the degree to which each item applies to their current work situation on a 7-point scale ranging from 'completely does not describe my situation' to 'completely describes my situation'. Mean scores across all 13 items were used in the analyses. Higher scores indicate a higher degree of work stress. *Cronbach alpha* of the scale for Work Stress was 0.92 for fathers and 0.89 for mothers.

#### *Perceived partner support (Time 2)*

Perceived Partner Support was measured using the Relational Support Inventory (RSI, Scholte, van Lieshout, & van Aken, 2001). Five dimensions of perceived support (described below) measured by six items each along a five-point Likert-scale ranging from (1) *very untrue of this person* to (5) *very true of this person*. The first support dimension is perceived *Quality of Information* and assesses the quality of information (e.g. 'This person explains or shows how I can make or do something') versus withholding of information (e.g. 'This person says things that are not true in order to get rid of me or to lead me astray'). The second support dimension is perceived *Respect for Autonomy* and assesses respect for autonomy (e.g. 'This person lets me solve problems as much as possible on my own but

also provides help when I ask for it') versus limit setting (e.g. 'This person makes decisions that I would like to make myself'). The third support dimension is perceived *Emotional Support* and assesses warmth (e.g. 'This person supports what I am doing') versus hostility (e.g. 'In this person's view, I can't do anything right: he/she is always criticizing me'). The fourth support dimension is perceived *Convergence of Goals* and assesses the perceived degree of convergence (e.g. 'This person and I have the same opinions on the use of drugs, alcohol or gambling') versus divergence (e.g. 'This person and I have many conflicts with regard to school achievement, the future or career opportunities' of goals). A fifth dimension was added, measuring the overall *Acceptance* by the partner (e.g. 'This person accepts me as I am'). We computed *perceived partner support* scores by averaging the scores on the five support dimensions, separately for fathers and mothers. *Cronbach alpha's* of these mean support scores were 0.81 for fathers and 0.83 for mothers.

#### *Parental perceptions of adolescents problem behaviour (Time 2)*

To assess adolescents' internalising and externalising problem behaviour, two scales of the Nijmegen Problem Behaviour List (NPBL; Scholte, Vermulst, & De Bruyn, 2001) were used: the subscales withdrawn and Anxious/Depressed Behaviour problems (together Internalising), and the subscales Aggressive and Delinquent Behaviour problems (together Externalising). Each subscale consisted of five items. The structure of the NPBL was modelled after the Child Behaviour Checklist (CBCL; Verhulst, Van der Ende, & Koot, 1996). However, in contrast with the CBCL, the NPBL focuses on subclinical instead of clinical problem behaviour. The items represent the most common problems in adolescence that cause some concern, but are not serious enough for referral. Examples of items are: 'This person would rather be alone than with other people' (Withdrawn); 'This person feels sad and unhappy' (Anxious/Depressed Behaviour); 'This person does things that could get him/her into trouble with the law' (Delinquency); 'This person fights a lot' (Aggressive Behaviour). Mothers and fathers were asked to indicate on five-point Likert scales ranging from 1 (not at all true) to 5 (completely true) the extent to which each item was true for each of the two adolescents participating in the study. *Cronbach alpha's* for internalising problems were 0.88 and 0.87, and for externalising problems were 0.85 and 0.83, for father and mother, respectively. To aggregate the scores of the oldest and the youngest adolescent, one score for internalising and one score for externalising was constructed per family, by taking the highest (i.e. most problematic) score.

#### **Plan of analyses**

We used a hierarchical multiple regression approach to study the correlates of short-term personality change. For mothers and fathers separately, we performed regression analyses in which a personality variable at Time 3 was in a first step regressed on the same variable at Time 1. This indicates the stability of that personality variable. In a second step, we then added Life Satisfaction, Work Stress, Perceived Partner Support or the two aspects of Adolescents' Problem Behaviour at Time 2 as a second set of predictors. This indicates the extent to which the Time 2 variable is associated with the change in the personality variable from Time 1 to Time 3.

The intercorrelations between the various midlife concerns were without exception statistically significant and generally similar between fathers and mothers. The correlates of Life Satisfaction for fathers (mothers in brackets) were as follows:  $-0.45$  ( $-0.17$ ) with Work Stress,  $0.38$  ( $0.42$ ) with Perceived Partner Support,  $-0.19$  ( $-0.30$ ) with Adolescents'

Externalising Problems and  $-0.27$  ( $-0.26$ ) with Adolescents' Internalising Problems. For Work Stress:  $-0.24$  ( $-0.23$ ) with Partner Support,  $0.16$  ( $0.31$ ) with Externalising Problems and  $0.24$  ( $0.30$ ) with Internalising Problems. For Partner Support:  $-0.34$  ( $-0.31$ ) with Externalising Problems and  $-0.26$  ( $-0.27$ ) with Internalising Problems. Finally, Adolescents' Externalising and Internalising Problems were correlated  $0.55$  for father reports and  $0.62$  for mother reports. These significant associations would normally call for a regression approach in which all predictors are entered simultaneously. However, to keep our results comparable with studies which have only measured some of the midlife concerns that we analyse, we first perform separate regression analyses for each midlife concern. The results of those regression analyses can be compared to other studies. After this, we will perform one regression analysis for fathers and one for mothers, in which all midlife concerns are entered simultaneously, in order to estimate the unique contribution of a midlife concern, corrected for the interdependence between the various concerns.

## RESULTS

### Preliminary analyses

Mean differences in between fathers and mothers in personality and midlife concerns are presented in Table 1 and tested with pairwise *t*-tests. On the Big Five personality dimensions at Time 1 and at Time 3, a similar pattern was found. Fathers described themselves as lower in Extraversion and Agreeableness, but higher in Emotional Stability and Openness. No differences between fathers and mothers were found for Conscientiousness. At Time 2, fathers reported a lower level of life satisfaction than mothers and a higher level of work stress, and reported more externalising problems in their

Table 1. Mean differences (standard deviations) between fathers and mothers in personality (Time 1 and Time 3) and midlife concerns (Time 2)

	Fathers	Mothers	T-Value	Effect Size ( <i>d</i> )
Time 1 Personality				
Extraversion	4.46 (1.25)	4.73 (1.25)	$-2.60^*$	$-0.23$
Agreeableness	5.54 (0.63)	5.67 (0.59)	$-3.01^{**}$	$-0.26$
Conscientiousness	5.06 (1.00)	5.18 (1.03)	$-1.43$	$-0.12$
Emotional stability	4.63 (1.08)	4.14 (1.08)	$5.33^{***}$	$0.46$
Openness	4.81 (1.01)	4.53 (1.07)	$3.25^{**}$	$0.28$
Time 3 Personality				
Extraversion	4.60 (1.19)	4.80 (1.21)	$-2.20^*$	$-0.19$
Agreeableness	5.55 (0.63)	5.69 (0.56)	$-2.93^{**}$	$-0.26$
Conscientiousness	5.10 (1.01)	5.24 (1.03)	$-1.66$	$-0.14$
Emotional stability	4.73 (1.04)	4.31 (1.03)	$4.85^{***}$	$0.42$
Openness	4.83 (0.98)	4.57 (1.06)	$3.05^{**}$	$0.27$
Time 2 Midlife concerns				
Life satisfaction	3.86 (0.62)	4.04 (0.62)	$-4.20^{***}$	$-0.37$
Work stress	2.75 (0.97)	2.38 (0.86)	$4.33^{***}$	$0.38$
Perceived partner support	4.27 (0.38)	4.30 (0.38)	$-1.24$	$-0.11$
Externalising problems	1.75 (0.49)	1.65 (0.46)	$3.23^{**}$	$0.28$
Internalising problems	2.21 (0.66)	2.22 (0.62)	$-0.20$	$-0.02$

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

Table 2. Stability coefficients and percentage of reliable changers on the five personality dimensions

	Father	Mother	Father		Mother	
	Stability wave 1–3	Stability wave 1–3	Increase/decrease	Chi-Square	Increase/decrease	Chi-Square
Extraversion	0.76*	0.83*	5.6/8.7	57.35***	4.5/5.9	18.90***
Agreeableness	0.71*	0.69*	4.9/5.6	18.07***	4.2/6.6	23.55***
Conscientiousness	0.77*	0.78*	3.5/6.3	17.97***	3.8/3.5	3.25
Emotional stability	0.75*	0.79*	4.2/5.6	14.63**	1.0/4.2	5.65 <sup>a</sup>
Openness to experience	0.80*	0.81*	4.2/3.8	5.48 <sup>a</sup>	2.4/4.5	4.79 <sup>a</sup>

<sup>a</sup> $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

Note: Stability wave 1–3 represents the Pearson correlation between wave 1 and wave 3.  $X/Y$  represents percentage increase and decrease, respectively, based on the RCI. The Chi-square tests whether the observed distribution of changers and non-changers differs from the expected distribution if change were random (i.e. 2.5% decrease and increase, 95% remain the same).

adolescent children, whereas no differences were found in reports on internalising behaviours.

Repeated measures ANOVAs on the Time 1 and Time 3 levels of the Big Five personality dimensions for fathers showed a small increase over the period of 2 years in Extraversion ( $F(1,284) = 6.28$ ,  $p < 0.05$ ) and in Emotional Stability ( $F(1,283) = 5.19$ ,  $p < 0.05$ ). For mothers, only a (somewhat stronger) increase in Emotional Stability was found ( $F(1,278) = 12.71$ ,  $p < 0.001$ ).

To investigate interindividual differences in intra-individual change in personality, the Reliable Change Index (RCI; Christensen & Mendoza, 1986; Jacobson & Truax, 1991) was calculated for each personality dimension, to assess the extent to which fathers and mothers showed reliable personality change over a 2-year period (i.e. from the first to the third measurement wave).<sup>1</sup> If individual level change were random, then we would expect the distribution of RC scores to be normal, with approximately 2.5% below  $-1.96$ , 2.5% above  $1.96$  and 95% of the participants remaining the same. That is, we would expect roughly 5% of the sample to increase and decrease and 95% to not change reliably. Table 2 shows that for the majority of fathers (85.8%–92%) and of mothers (89.2%–94.8%), change on any given personality dimension over this 2-year period can be most likely attributed to measurement unreliability. This is corroborated by the high stability coefficients for the Big Five dimensions (ranging between 0.69 and 0.83). However, a sizable minority of adults

<sup>1</sup> The RCI is computed by

$$RC = X_3 - X_1 / S_{\text{diff}}$$

where  $X_1$  represents a person's score at time one,  $X_3$  represents that same person's score at time three and  $S_{\text{diff}}$  is the standard error of difference between the two test scores, which can be computed using the standard error of measurement:

$$S_{\text{diff}} = \left( 2(S_E)^2 \right)^{1/2} = 2^{1/2} S_E$$

The standard error of the difference score represents the spread of the distribution of change scores that would be expected if no actual change has occurred. RC scores smaller than  $-1.96$  or larger than  $1.96$  are unlikely to occur without true change and are thus considered reliable.



did show change that exceeded the level expected by accounting for measurement unreliability. This was at least marginally significant the case for all the personality dimensions for fathers, and for all dimensions but Conscientiousness for mothers. It appears that, despite the high interindividual stability, some adults do reveal reliable change in personality dimensions.

The five RCI's for fathers showed moderate correlations, that all were significant (range  $r = 0.15$  to  $r = 0.30$ ; with the exception of the correlation between the RCI for Openness and the RCI for Emotional Stability ( $r = 0.03$ ). This indicates that change in personality often is not restricted to one of the Big Five dimensions, but tends to co-occur across dimensions. The five RCI's for mothers were less correlated: the RCI for Agreeableness was significantly correlated with the RCI's for Extraversion ( $r = 0.13$ , Conscientiousness ( $r = 0.16$ ) and Openness ( $r = 0.30$ ), and the RCI for Extraversion was additionally correlated to the RCI for Emotional Stability ( $r = 0.28$ ). Fathers' and mothers' RCI's were significantly correlated only in the case of Openness ( $r = 0.14$ ).

### **Hierarchical multiple regression analyses on life satisfaction, work stress, perceived partner support and adolescents' problem behaviour as correlates of personality change**

Table 3 presents the first-order correlations between midlife concerns at Time 2 and personality at Time 3 (in brackets) as well as the results of the univariate hierarchical multiple regression analyses ( $\beta$ 's for incremental effects, i.e. after correcting for stability of personality). Note that separate regressions were conducted for each pair of predictor and outcome variable; because of the associated large number of significance tests (i.e. 50), results that were not significant at the stricter  $p = 0.01$  level will be interpreted with caution.

First of all, the first-order correlations show that for all Big Five dimensions, with the exception of Openness, substantial associations are found between the midlife concerns Life Satisfaction, Work Stress, Perceived Partner Support and the two aspects of Adolescents Problem Behaviour on the one hand and personality dimensions on the other. Also, these associations seem to be present for all midlife concerns.

It can also be seen, however, that small but significant associations are found between change in the Big Five personality dimensions and the level of midlife concerns. Squaring these predictive correlations, fathers' Life Satisfaction explains 3% of their change in Extraversion, and 1% of their change in Emotional Stability. No effects of fathers' Life Satisfaction on their change in Agreeableness, Conscientiousness and Openness were found. Likewise, father's Work Stress predicts 3% of their change in Extraversion and Emotional Stability, and 1% of their change in Agreeableness (only significant at  $p < 0.05$ ). Fathers' Perceived Partner Support predicts 1% of their change in Agreeableness, their change in Conscientiousness and their change in Emotional Stability (although these three effects were only marginally significant). No effects on change in Extraversion and Openness were found. Finally, fathers' perception of the Internalising Problem Behaviour of their adolescent children predicts 1% of their change in Extraversion (significant at  $p < 0.05$ ), and Emotional Stability (marginally significant) and 2% of their change in Agreeableness. No effects on change in Conscientiousness and Openness were found, as were no effects of the perceptions of Externalising Problem Behaviour.

Table 3. Incremental effects (beta's) of Time 2 midlife concerns on Time 3 personality after correcting for Time 1 personality (first order correlations between Time 2 midlife concerns and Time 3 personality in brackets)

	Personality dimension				
	Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness
		Fathers' midlife concerns			
Life satisfaction	0.16*** (0.33***)	0.07 (0.29***)	0.04 (0.10)	0.12** (0.38***)	-0.04 (0.07)
Work stress	-0.17*** (-0.37***)	-0.09* (-0.26***)	-0.03 (-0.02)	-0.20*** (-0.43***)	-0.04 (-0.06)
Perceived partner support	0.06 (0.24***)	0.08 <sup>a</sup> (0.23***)	0.08 <sup>a</sup> (0.22***)	0.07 <sup>a</sup> (0.18**)	0.03 (0.09)
Externalising problems	0.03 (-0.14*)	-0.00 (-0.16**)	-0.01 (-0.20**)	-0.00 (-0.13*)	-0.06 (-0.04)
Internalising problems	-0.11* (-0.25****)	-0.14** (-0.31****)	-0.03 (-0.14*)	-0.09 <sup>a</sup> (-0.17**)	-0.01 (-0.15 <sup>b</sup> )
		Mothers' Midlife Concerns			
Life satisfaction	0.02 (0.17**)	0.14** (0.32****)	0.15** (0.32****)	0.02 (0.12*)	0.09** (0.14 <sup>b</sup> )
Work stress	-0.01 (-0.12 <sup>b</sup> )	-0.07 (-0.13 <sup>b</sup> )	0.02 (0.01)	-0.10* (-0.32****)	-0.05 (-0.12 <sup>a</sup> )
Perceived partner support	0.03 (0.17**)	0.12** (0.28****)	0.11** (0.27****)	0.07* (0.12*)	0.06 <sup>a</sup> (0.08)
Externalising problems	-0.04 (-0.12*)	-0.04 (-0.18**)	-0.05 (-0.12 <sup>a</sup> )	-0.07 (-0.26****)	0.00 (-0.01)
Internalising problems	-0.04 (-0.14 <sup>b</sup> )	-0.04 (-0.14 <sup>b</sup> )	0.01 (-0.10)	0.02 (-0.24****)	-0.01 (0.04)

<sup>a</sup> $p < 0.10$ ; <sup>b</sup> $p < 0.05$ ; <sup>c</sup> $p < 0.01$ ; <sup>d</sup> $p < 0.001$ .

Table 3 also present the results of the same analyses for mothers. For mothers, the first order correlations show that all of the Big Five dimensions are associated with at least one of the midlife concerns Life Satisfaction, Work Stress, Perceived Partner Support and the two aspects of Adolescents Problem Behaviour, and that all of the midlife concerns are associated with at least one personality dimension.

Again small but significant associations are found between change in personality dimensions and the level of midlife concerns. Mothers' Life Satisfaction predicts change in their Agreeableness (2%), Conscientiousness (2%) and Openness (1%), but not in Extraversion or Emotional Stability. Mothers' Work Stress failed to predict changes in personality at the  $p < 0.01$  level, though it predicted 1% of the change in Emotional Stability at the  $p < 0.05$  level.<sup>2</sup> Mothers' Perceived Partner Support predicts their change in Agreeableness (1%), Conscientiousness (1%), Emotional Stability (1%, although again this was only significant at the  $p < 0.05$  level) and Openness (1%, although this was only marginally significant). Mothers' perception of the Externalising or Internalising Problem Behaviour of their adolescent children did not predict any change in personality.

### **Combined hierarchical multiple regression analyses on life satisfaction, work stress, perceived partner support and adolescents' problem behaviour**

Because of the large number of significance tests presented in Table 3, we supplemented our analyses with a series of combined hierarchical multiple regression analyses. That is, we again inserted the Time 1 personality variables as a first block predicting the corresponding Time 3 scores, indicating these variables' longitudinal stability. In a second block, we added Life Satisfaction, Work Stress, Perceived Partner Support and the two aspects of Adolescents' Problem Behaviour as predictors of personality change between Time 1 and 3. First of all, these multivariate tests act as a statistical 'gatekeeper', as the significance testing of the block of combined midlife concerns takes into account the number of predictor variables (i.e. 4). Second, when this block adds significantly to the prediction of variance in personality change, the unique contribution of each predictor variable can be discerned.

Table 4 presents the results of these hierarchical multiple regression analyses. For fathers, these combined regression equations did not lead to a significant second step in the prediction of Conscientiousness and Openness. Fathers' change in Extraversion ( $\Delta R^2 = 0.04$ ) was uniquely predicted by their Life Satisfaction ( $\beta = 0.10$ ) and their Work Stress ( $\beta = -0.12$ ). Higher Life Satisfaction and lower Work Stress predicted higher levels of Extraversion. Fathers' change in Agreeableness ( $\Delta R^2 = 0.02$ ) was predicted by the perception of Adolescents' Internalising Problems ( $\beta = -0.12$ ): the more problems a father reports, the lower his Agreeableness. Fathers' change in Emotional Stability ( $\Delta R^2 = 0.04$ ) was again predicted by their Work Stress ( $\beta = -0.16$ ): the higher the level of stress, the lower their Emotional Stability. No unique effects of Perceived Partner Support or for Adolescents' Externalising Problems were found.

<sup>2</sup>These non-significant findings could of course be due to the fact that not all mothers in the sample were employed. In fact, only 5.6% of the mothers was full-time employed and another 59% worked part-time. However, when we repeated the analyses for only the part- and full-time working mothers, the results were basically the same.

Table 4. Hierarchical multiple regression analyses predicting parents' personality at Time 3 from personality at Time 1 (Step 1), and additionally from life satisfaction, work stress, perceived partner support and adolescents' problem behaviour (entered simultaneously in Step 2)

Personality variable	Fathers		Mothers	
	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$
Extraversion Time 3				
Step 1 (Extraversion Time 1)	0.58***	0.76***	0.70***	0.81***
Step 2	0.04***		0.01	
Life satisfaction Time 2		0.10*		0.01
Work stress Time 2		-0.12**		0.02
Perceived partner support Time 2		-0.00		-0.03
Adolescents' problem behaviour Time 2		0.04/-0.07 <sup>+</sup>		-0.04/-0.06 <sup>+</sup>
Agreeableness Time 3				
Step 1 (Agreeableness Time 1)	0.51***	0.71***	0.47***	0.66***
Step 2	0.02*		0.02 <sup>a</sup>	
Life satisfaction Time 2		0.01		0.10 <sup>a</sup>
Work stress Time 2		-0.06		-0.03
Perceived partner support Time 2		0.05		0.05
Adolescents' problem behaviour Time 2		0.02/-0.12*		0.01/-0.05
Conscientiousness Time 3				
Step 1 (Conscientiousness Time 1)	0.58***	0.76***	0.61***	0.78***
Step 2	0.01		0.02*	
Life satisfaction Time 2		0.00		0.10*
Work stress Time 2		-0.01		0.05
Perceived partner support Time 2		0.08		0.03
Adolescents' problem behaviour Time 2		0.02/-0.02		-0.03/0.02
Emotional stability Time 3				
Step 1 (Emotional stability Time 1)	0.56***	0.74***	0.63***	0.78***
Step 2	0.04***		0.01	
Life satisfaction Time 2		0.06		-0.01
Work stress Time 2		-0.16***		-0.09
Perceived partner support Time 2		0.03		0.05
Adolescents' problem behaviour Time 2		0.01/-0.04		-0.07/0.05
Openness Time 3				
Step 1 (Openness Time 1)	0.63***	0.79***	0.66***	0.82***
Step 2	0.01		0.01	
Life satisfaction Time 2		-0.09		0.09
Work stress Time 2		-0.06		-0.04
Perceived partner support Time 2		0.03		0.03
Adolescents' problem behaviour Time 2		-0.06/-0.01		0.01/0.02

<sup>a</sup> $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

<sup>+</sup>Externalising problems/internalising problems.

For mothers, these combined regression equations only lead to a significant second step in the prediction of Conscientiousness ( $\Delta R^2 = 0.02$ ), and a marginally significant second step in the prediction of Agreeableness ( $\Delta R^2 = 0.02$ ). In both cases, mothers' change in personality was predicted by their Life Satisfaction (in both cases  $\beta = 0.10$ ): higher Life Satisfaction predicted higher levels of Conscientiousness and Agreeableness. For mothers, no unique effects of Work Stress, Perceived Partner Support or Adolescents' Externalising or Internalising Problem Behaviour were found.

## DISCUSSION

In this study, we set out to study correlates of personality change in middle adulthood. We hypothesized that successful adaptation to age-appropriate adult social roles would be related to personality maturation, that is, to higher scores on the Five Factor personality dimensions. We tested this by relating the change in Five Factor personality dimensions over a period of 2 years, in a sample of fathers and mothers of adolescent children, to their evaluation of their role of worker (in terms of work stress), of spouse (in terms of perceived partner support) and of parent (in terms of their adolescent childrens' problem behaviour). Also, we related change in personality to an overall dimension of life satisfaction.

It should be noted that a large amount of stability in personality was found over this period of 2 years. Stability coefficients did not reach unity, but approached the upper limits set by the reliability of the personality scales. Accordingly, it is all the more impressive that we found reliable and meaningful change in personality in this period of the life span.

First, the RCI's indicated that on all of the personality dimensions for fathers and almost all of the personality dimensions for mothers, at least a trend towards a distribution of changers and non-changers that deviates from what would be expected by chance was found. For both mothers and fathers, decreasees and increasees were clearly found for Extraversion and Agreeableness. For fathers, they were also clearly found for Conscientiousness and Emotional Stability. For mothers, for these two dimensions this was less clear or even not significant.

Second, these changes in personality were found to be associated with midlife concerns in a meaningful way. In spite of the large number of statistical tests, the number of significant effects of midlife concerns far exceeded the level that would have been expected by chance. These effects explained small (from 1 to 4%) amounts of the changes in the personality dimensions over the period of 2 years. For fathers, low work stress seems to be related to their maturation in emotional stability, and also to an increase in extraversion. This last increase is also related to a high general life satisfaction. In addition, fathers' perception of internalising problems in their children seems to hinder their maturation in agreeableness. For mothers, their maturation in conscientiousness and agreeableness seems to be related to their general life satisfaction.

In line with Social Investment Theory, successful overall adaptation to the normative social roles of mid-life, as captured through a general index of life satisfaction, was related to personality maturation (i.e. to selected aspects of personality change in the direction of greater social desirability) for both mothers and fathers. In addition to predictions from the social investment principle, our results show that social role effects are not limited to agreeableness, conscientiousness and emotional stability, as effects were also found for extraversion and openness. Our results also show that handling adult social roles is not only related to personality change in young adulthood but continue to be related to personality change in middle adulthood. Again, it should be stressed, however, that although this evidence does not falsify Social Investment Theory, it does not run counter to endogenous explanations of personality change, as it is possible that (unmeasured) personality changes at Time 2 drive people's adaptation to midlife concerns; this alternative explanation can only be ruled out with the use of longitudinal research employing a full cross-lagged statistical design.

Although there appear to be no differences between fathers and mothers in the stability of the Five Factor personality dimensions, there do seem to be differences in the correlates of change in these dimensions. For fathers, several correlates of personality change were

found, in several midlife concerns. For mothers, similar results were found in the univariate analyses, although they seem to disappear when all predictors were simultaneously entered in the regression equation. For mothers, the strongest effects were found for life satisfaction in general. Perhaps the other effects disappeared because when general life satisfaction is higher, mothers are better able to handle more specific midlife concerns.

This could also mean that mothers' personality change, although not less than that of fathers', is either more based on stochastic processes (Fralely & Roberts, 2005; Lewis, 1997), more or less varying across people in a random manner, or is related to external factors that were not included in this study. For fathers' change in personality, we may have chosen the midlife concerns that indeed are uniquely relevant, although other relevant factors may also still be present.

Comparing our results with those of the Mills study of women's adult development (Roberts, 1997; Roberts et al., 2002), we see that the effects of paid work on personality change that were found in that sample were not confirmed in our sample, not even when our analyses were restricted to those mothers who actually were (partly) employed. This could reflect a cultural difference (The Netherlands is known for its low number of full-time employed females, suggesting that successful employment might be less a norm for females), a cohort difference (the women in the Mills study were born in the late 1930s, the mothers in the present study at the end of the 50s) or a combination of both. The finding of Roberts et al. (2002) that marital tensions or divorce were related to personality change in females was confirmed in our data on the importance of perceived partner support for mothers' personality change. Future studies might extend our choice of midlife concerns, focusing on other roles that are important in the life of adults, particularly of women.

### LIMITATIONS OF THE PRESENT STUDY

This study does not adequately address issues of causality: the findings that several midlife concerns are related to changes in personality do not necessarily imply that these concerns cause changes in personality. The design of this study did not permit fully cross-lagged analyses that would have been needed to test the directional predominance of either personality or midlife concerns. However, note that in our regression design, any effects of earlier personality on midlife concerns are corrected for by entering the stability of personality first. But, admittedly, it still could be the case that personality *change* causes midlife concerns. However, although it is comprehensible that changes in personality cause a lower level of life satisfaction, this is harder to imagine for a lower level of work or marital satisfaction, and even harder for a higher level of adolescent children's' problem behaviour. But, a full longitudinal design and cross-lagged analyses would be needed to shed more light on this issue.

Another limitation of the present study concerns the fact that all constructs were measured using parental self-reports, introducing the possibility that some of associations found between personality and midlife concerns are confounded by stable individual differences in response bias (e.g. due to social desirability or extremity of responding). However, although such stable, shared method variance might affect the concurrent correlations between personality and midlife concerns, this would again be controlled for in our regression design because personality at Time 1 was entered first, and the associations of midlife concerns were with the residuals in the analyses (i.e. with the change in personality from Time 1 to Time 2).

It should also be noted that the sample for this study consisted of relatively well-functioning, intact two-parent families. Accordingly, the 'midlife concerns' that were assessed by the

current study may reflect only relatively benign worries about various aspects of life instead of truly existential problems. However, the fact that the current results were found in spite of this possible restriction of range suggests that once they develop into real existential problems, such midlife concerns might have much stronger effects on personality. Also, for adolescent problem behaviours, besides the fact that these also might be relatively minor in this sample, we did not address the question whether the gender of the child also influences the relationship between adolescents' behaviour and parents' personality development. Last, this sample consisted of two-parent, middle class, native Dutch families, and it remains to be investigated whether the results can be generalized to other kinds of families, in other socio-economic situations, or in other cultures.

## CONCLUSIONS

In sum, despite high stability of personality, personality change in middle adulthood seems to be related to midlife concerns in a meaningful way. A general feeling of life satisfaction and, especially for men, adequate fulfilment of the roles of worker and parent, seem to lead to personality maturation on several of the Five Factor personality dimensions. The study of other roles, and particularly of relevant roles for women, might complete the picture of personality change during middle adulthood.

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