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Type D personality: predictor of general psychological distress after military deployment?

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Abstract

Introduction: the current thesis examines the question whether type D personality is a risk factor in military personnel for an increase in psychological symptoms post deployment after controlling for psychological symptoms predeployment. Type D personality is defined as a *distressed* personality type, which consists of the combination of Negative Affectivity (the tendency to experience negative emotions) and Social Inhibition (the tendency to inhibit self-expression in social interaction). Previous research is concentrated on the predictive power of type D personality in worse health outcomes after myocardial infarct. Could type D personality also prospective play a role in the experience of more psychological symptoms post deployment?

Methods: this thesis was part of the large prospective Dutch study PRISMO, concerning psychological and immunological effects of deployment. This thesis concentrated on the role of personality traits in the experience of mental and physical symptoms pre- and post deployment. Symptoms were measured with the SCL-90 and type D personality was measured with the DS14. Because the DS14 is a recently developed questionnaire and has not been used on military personnel before, reliability tests and a factor analysis will be conducted.

Hypotheses: Individuals with type D personality were expected to show more symptoms predeployment, and therefore also more symptoms post deployment, but as an effect of deployment there would be a larger increase in symptoms than in the non-type D group. Another hypothesis was that type D is a (prospective) predictor for the level of symptoms after deployment, controlled for level of symptoms post deployment. Other important hypotheses were that type D personality is less prevalent in military personnel than in a general healthy Dutch population and that it is a stable trait in this cohort because this research concerns a healthy, selected, stable population.

Results: Individuals with type D personality had more symptoms pre- and postdeployment, and there was no effect of deployment on level of symptoms. Exceptions were the subscales ‘interpersonal sensitivity and paranoid ideation’ where there was an effect of deployment, and ‘sleeping problems’ where there was an additional interaction effect on level of symptoms post deployment. After controlling for predeployment symptoms, type D personality had a unique contribution of 2%. This effect was significant, but the clinical implications are questionable. Furthermore, type D personality was less prevalent in military personnel than in civilians. As expected, type D personality was stable over time and therefore was found to be a trait.

1. Introduction

During military deployment, personnel is exposed to various kinds of acute stressors and chronic stress. They have a higher probability of experiencing traumatic events than civilians. Research has indicated that between 12% and 19% of American veterans experienced mental health problems (major depression, generalized anxiety and posttraumatic stress disorder) several years after deployment (Hoge, Castro, Messer, McGork, Cotting & Koffman, 2004; Boscarino, 2006; Hoge, Auchterlonie & Milliken, 2006). More information about risk factors before or during deployment predicting vulnerability for later (mental) health problems, could be helpful to develop specific primary and secondary prevention programs to avoid psychopathology (to develop or to get worse). Screening for personality and biological characteristics in longitudinal studies before and after deployment could improve this specific scientific knowledge. For this purpose the Dutch Prospection in Stress Related Military Research (PRISMO; started in 2005) systematically collects data concerning personality traits, general psychological distress, biological data and the actual occurrence of stressful/traumatic events during deployment in a longitudinal prospective study within several cohorts of military employees (www.prismo.nl).

Denollet (1998a) defined type D personality as a *distressed* personality type which consists of the simultaneous occurrence of Negative Affectivity (the tendency to experience negative emotions) and Social Inhibition (the tendency to inhibit self-expression in social interaction). It is required that the individual scores 10 or higher on both personality traits to be classified as type D personality. Research on Coronary Heart Disease (CHD) showed that type D personality can be a prospective risk factor for worse general health outcomes (Denollet, 2005). The main question in this current thesis is whether type D personality is a risk factor for developing general psychological symptoms as a consequence of deployment.

1.1 Mental and general health problems in veterans

There is growing evidence that exposure to psychologically traumatic events is related to increased morbidity and mortality. Boscarino (2006) found that mortality for veterans with PTSD was higher than for veterans without PTSD 30 years post war. Veterans with PTSD were more likely to die because of external causes (i.e. drug overdose, suicide), cardiovascular problems and cancer. Hoge et al. (2004) studied veterans returning from Iraq and Afghanistan

and found a significant difference between these groups in perceived health. The soldiers and marines who had been deployed to Iraq reported more exposure to traumatic events and more mental health problems than those returning from Afghanistan. Hoge et al. (2006) found that among Iraqi veterans 31% had at least one outpatient mental health care visit within the first five years post deployment. Hotopf et al. (2006) however, only found a difference in the occurrence of multiple physical symptoms between veterans from the UK who had been and who had not been deployed. There were no differences between the groups in the prevalence of common mental disorders, fatigue and self rated general health.

1.2 Type D (distressed) personality

Type D personality originally was developed within research concerning Coronary Heart Diseases (CHD). Type D seemed to be a predictor of worse health outcomes in patients with CHD, but researchers were lacking measurement tools that could be used for adequate characterization of individual risks (Denollet, 1998a). There was evidence that psychosocial factors were associated with CHD, but which factors were important was unclear. Friedman and Rosenman (1974; in Gray, 2002) introduced the term 'type A behavior'. Individuals who had the characteristics: being competitive, aggressive, easily irritated, impatient workaholics, constantly concerned with deadlines and getting ahead were classified as type A persons. Type A subjects developed cardiovascular diseases at double the frequency as non-type A persons, here named type B persons. Attempts to replicate these results produced mixed results. The current believe is that prolonged or frequent negative emotions in general can increase one's risk for heart disease, but that a hard-working, constantly rushed person who enjoys what he is doing is not at a special risk (Gray, 2002). Research on type A also did reveal that the experience of emotional distress in general is related tot CHD. Denollet (1998b) continued the research on personality traits and CHD, and found that the combined occurrence of the traits Negative Affectivity (NA) and Social Inhibition (SI) the type D (*distressed*) personality increases the risk on CHD up to a fourfold compared to a non-type D group. Type D represents a personality profile characterized by both the tendency to experience negative emotions (NA) and the propensity to inhibit self-expression in social interaction (SI) (Denollet & van Heck, 2001). NA refers to the tendency of experiencing negative emotions across different times and situations. Individuals that score high on NA experience more feelings of dysphoria, anxiety and irritability; have a negative view of self; and scan the world for signs of impending trouble.

SI refers to the tendency to inhibit the expression of emotions/behaviors in social interactions to avoid disapproval by others. High-SI individuals tend to feel inhibited, tense and insecure when with others (Denollet, 2005).

Denollet and colleagues (1998a) developed a questionnaire to assess type D personality, the DS14 (originally DS16). Denollet (2005) found that individuals with type D personality had a vulnerability to experience chronic distress. Subsequently he found that 28% of the general population in the Netherlands/Belgium were classified as a type D personality. Type D personality has been found to vary between different nationalities (31.6% in China and 38.5% in Great Britain) (Williams et al., 2008; Xiao-Nan & Jian-Xin, 2006).

1.3 Type D and NEO-FFI

De Fruyt and Denollet (2002) studied the similarities and differences between type D personality (measured with the DS16) and the Five-Factor model of Personality (NEO-FFI) (Eysenck, 1991; in De Fruyt & Denollet 2002) in a study within 155 healthy subjects. NA strongly correlated positively with neuroticism and negatively with Conscientiousness, Agreeableness and Extraversion¹. SI strongly correlated negatively with extraversion, Agreeableness and Conscientiousness and positively with neuroticism. There were no significant correlations between Openness and SI or NA. Pedersen and Denollet (2008) found that type D had unique prognostic values. A head-to-head comparison confirmed that type D personality, but not the combination of high neuroticism/low extraversion as measured by the NEO-FFI, predicted major adverse clinical events (MACE) in a group of 230 Coronary Heart Disease patients².

1.4 Type D and stability

Type D personality seemed to be a stable construct over time in patients with a not ongoing cardiac infarct: Denollet (2005) found test-retest correlations of 0.82 for the SI scale and 0.72 for the NA scale measured after three months, without controlling for life-events. Bramsen, van der Ploeg, van der Kamp and Adèr (2002) found that personality traits do not necessary stay stable over time. The personality trait neuroticism changed for some individuals after deployment and this was explained by the meaning attributed to the deployment. Military

¹ Correlations of NA and Neuroticism ($r = 0.68$), Conscientiousness ($r = -0.38$), Agreeableness ($r = -0.37$) and extraversion ($r = -0.35$). Correlations of SI and Extraversion ($r = -0.52$), Agreeableness ($r = -0.37$), Conscientiousness ($r = -0.40$) and Neuroticism ($r = 0.49$) (p 's are $< .001$)

² Type D personality: OR=3.11, 95%CI 1.33-7.27, $p=.009$, NEO-FFI: (OR=0.63, 95%CI 0.25-1.60, $p=.33$)

personnel who attributed the deployment as negative, tended to have a higher score on neuroticism, measured with the NEO-PI-R. This may perhaps suggest that having a negative view on the mission is responsible for a higher score on neuroticism. The higher scores on neuroticism consequently predicted the level of PTSD symptoms, this result was significant. Bramsen et al. (2002) thus found empirical support for the clinical impression that a negative view on traumatic events may bring about personality changes. This might imply that personality traits that are determined after a traumatic event occurred, may not be on the same level as before the event. Prospective research can therefore be important. Srivastava, John, Gosling and Potter (2003) found that the Big Five traits are complex phenomena that are subject to a variety of developmental influences. We suggest that a deployment may be seen as a phase wherein young military personnel develop rather quickly because of the fact that they are a longtime away from home and are exposed to combat exposure and possibly traumatic events. They also need to interact intensively within a social group. These effects of the environment could change or intensify specific personality traits. But it is not clear if this effects already will be seen shortly after deployment.

1.5 Type D as predictor of (mental) health problems.

Because the DS14 is a relatively new instrument, there is a limited number of studies using this questionnaire. Most of the available studies are confined to cardiovascular patients. Evidence was found that a *distressed* personality (type D) can predispose people for worse health and psychological outcomes after a myocardial infarct (Pedersen & Denollet, 2004, Denollet, 2005). In a prospective study, Denollet, Vaes and Brutsaert (2000) found that type D personality was an independent prognostic factor of both poor perceived health and depressive affect in patients with coronary heart disease (CHD). The type D group had up to a fourfold higher risk of adverse health outcomes than the non-type D group. In men with CHD, type D has also been found to be a prognostic factor of cancer (Denollet, 1998b) and to be associated with depression and vital exhaustion (Pedersen & Denollet, 2004). In patients with chronic heart failure, type D patients were more likely to experience impairment in health status and reported symptoms of depression more often (Schiffer et al., 2005).

To predict the influence of type D personality on the consequences of unpredicted stressful situations, such as during deployment, studies will be described using *neuroticism* as personality feature. As mentioned above NA was strongly correlated with Neuroticism (De

Fruyt & Denollet, 2002, Chapman et al., 2007). The personality trait neuroticism has repeatedly been associated with symptoms of anxiety in general and posttraumatic stress disorder (PTSD) in specific (Parslow, Jorm and Christensen. 2006).

In a longitudinal prospective study Parslow et al. (2006) found that only two pre-trauma measures were associated with PTSD symptoms after a natural disaster, specifically depressive and anxiety symptoms and level of neuroticism. In another prospective study within a cohort of pregnant women, Engelhard, Van den Hout and Kindt (2003) found that pre-trauma neuroticism strongly predicted PTSD symptoms after miscarriage. De Fruyt and Denollet (2002) found that healthy individuals with type D reported significantly more somatic distress, anxiety and depression than non-type D individuals.

1.6 Type D and occupational stress

Some studies on type D personality are conducted together with job-related questionnaires. Like military employees, health care professionals are frequently confronted with death and stressful situations. Ogińska-Bulik (2006) studied the effect of type D personality in health care professionals and concluded that type D personality plays an important role in the perception of job stress and the occurrence of negative health outcomes. The employees with a type D personality perceived their work environment as more stressful, manifested more symptoms of professional burnout and mental health disorders like somatic symptoms, anxiety, insomnia and depressive symptoms.

1.7 Type D, personality traits and military deployment

Military employees are confronted with high standards for physical and mental health at job selection. To assess if a job applicant is capable of successfully fulfilling a military function, it is important to test if they acquire the predetermined selection criteria concerning personality traits, knowledge, skills and attitudes (Duel, 2006).

With regard to personality traits, Duel (2006) used the NEO-PI-R for a cohort of 1000 individuals that underwent a selection procedure for a military function. He found that the average score for neuroticism within the job-applicants was more than one standard deviation below the mean score for the general population. For extraversion the mean was more than one

standard deviation above average. This group also scored more than one standard deviation above average for altruism and conscientiousness³.

1.8 Current study

The main question that this study will seek to answer is the question whether type D personality in a group of military personnel is a risk factor for physical and psychological symptoms after deployment. The above raises the following subquestions and hypotheses.

- What is the percentage of type D personality within a group of military personnel who are going on a mission compared with a general Dutch/Belgium population?

Based on the previous described study of Duel (2006) and because type D was positively correlated with neuroticism and negatively correlated with extraversion (De Fruyt & Denollet, 2002) the hypothesis for the average frequency of type D personality in the current study is that the percentage of military employees with type D personality will be lower than that found in general populations (i.e. < 28%) (Denollet, 2005, Williams et al., 2008).

- Are negative affectivity (NA) and social inhibition (SI) stable traits in military employees before and after deployment?

Denollet (2005) found that type D personality measured with the DS14 in cardiovascular patients was not mood state-dependent but proved to be stable over time. He also found that NA and SI did not change significantly over time. Other research suggests that personality traits can change over time (Bramsen et al., 2002; Srivastava et al., 2003). Because the already selected military participants overall seem to be healthy and stable, we expect the traits to be stable over time.

- Is there a difference in general psychological symptoms between the type D group and the non-type D group directly after deployment, controlling for pre-deployment level of symptoms, age, preliminary deployments and different experiences during deployment?

People with negative affect may have a higher baseline level of symptoms because they are overall more distressed than people without negative affect. Engelhard et al. (2003) found this to be true for neuroticism in her prospective study on pregnant women. Based on this the

³ μ neuroticism = 109.3, μ extraversion = 177.3, μ altruism = 172.2, μ conscientiousness = 178.0

hypothesis is that the group with type D personality have more symptoms at baseline, and therefore more symptoms post deployment. Subsequently, because of the distressing characteristics of the type D individuals we expect them to experience even more symptoms as a result of the distressing effect of a deployment, than the non-type D individuals.

- Is type D personality a (prospective) predictor for the level of symptoms after deployment?

Different studies found that type D personality was a prognostic predictor of worse mental and physical health outcomes after myocardial infarct (Denollet, 1998*b*; Denollet et al., 2000; Schiffer et al., 2005). Because of these results the hypothesis is that type D personality is a prospective predictor for the level of symptoms after deployment. It is important to control for the level of symptoms predeployment because this will display if the general distress increases during deployment or that deployment had no effects on the level of symptoms.

In summary, the association between type D personality and amount of symptoms will be assessed, controlling for age, the amount of pre-mission symptoms, previous deployments and the actual experience of different kinds of (possible traumatic) events. The hypothesis is that pre-mission symptoms, traumatic events and previous deployments do play a role in the level of symptoms, but type D personality is an individual predicting factor.

2. Methods

2.1 *Prismo*

This thesis is part of a large Dutch longitudinal prospective study that started in 2005 and is named ‘Prospective Research in Stress Related Military Operations’ (PRISMO). The purpose of the study is to describe the effect of deployment on stress related parameters and symptoms. Information is collected on the balance between resilience and illness and this can contribute to insights into the development of stress regulation post deployment and the relation with psychological and physical symptoms. At this moment, the inclusion of 1000 participants is completed. Approximately 2000 participants are approached to participate in the study. With the information provided by the study, the prevention of health problems and treatment can be developed based on biological and psychological parameters. As far as known, this is the only longitudinal, prospective psychobiological/immunological study performed on military personnel.

Methods of the study are psychological questionnaires and biological parameters measured with blood and saliva, which are collected before deployment, approximately one month after deployment and six months after deployment. Psychological questionnaires are also collected one year, two, five and ten years post deployment. Participation in the study is voluntarily and the information is completely anonymous. Individual data are not available for the Defense organization. The participants are military personnel from the Dutch army that are assigned to a deployment to either Iraq or Afghanistan.

2.2 *Participants*

The total number of participants that was included in this thesis was 248 participants of the Task Forces Uruzgan (TFU) 2, 3 and 4. The sociodemographic information is listed in Table 1. All the participants were male. They had a mean age of 27.7 years (sd 8.0) and the level of education ranged from lower education to University level, with a skewed distribution towards lower education level. Most of the men were soldiers and there were as many corporals as non commissioned officers. Almost half of the group had experienced a previous deployment.

Table 1

Sociodemographic information.

categories	N	%
Age	248	
Mean (sd)	27.7 (8.0)	
Minimum	18	
Maximum	54	
Previous deployments	240	
Yes	114	47.5%
No	126	52.5%
Educational level	248	
Lower	109	44.4%
Medium	81	32.7%
Higher	51	20.2%
University	5	2.0%
Different	2	0.8%
Marital status	245	
Married	54	22.0%
Living together	46	18.8%
Long relationship	56	22.9%
Single	87	35.5%
Divorced	2	0.8%
Rank	244	
Soldier	109	44.3%
Corporal	50	20.5%
Non commissioned officer	49	20.1%
Officer	37	15.1%

2.3 Measures

DS14

To assess type D personality, the DS14 was used (appendix 1) (Denollet, 2005). This is a 14-item self-reported questionnaire that was developed to assess the personality traits Negative

Affectivity (NA) and Social Inhibition (SI) and the presence of type D personality in a reliable and standardized way that contains little burden to respondents (Denollet, 2005). Examples of items on the SI scale are: 'I make contact easily when I meet people' and 'I am a closed kind of person'. Examples on items of the NA scale are 'I am often irritated' and 'I often find myself worrying about something'. The items are rated on a five-point Likert scale, ranging from 0 (not right) to 4 (right). A person is classified as type D personality if he obtains a score on both scales of 10 or higher. The SI and NA scales can be used as continuous variable. Denollet (2005) found Cronbach's α of 0.88 on the NA scale and 0.86 on the SI scale. Because the DS14 is a recently developed questionnaire and has not been used on military personnel before, reliability tests and a factor analysis will be conducted.

SCL 90-R

The SCL-90-R is a 90-item self-reported symptom inventory that is designed to screen for a broad range of psychological symptoms. Each of the 90 items is rated on a five-point Likert-type scale, ranging from "not at all" (1) to "extremely" (5) for indication of the severity of symptoms over the past week. Subsequently, the answers are combined in eight primary symptom dimensions: phobic anxiety (d1); general anxiety (d2); depression (d3); hostility (d4); inadequacy of thought and action (d5); interpersonal sensitivity and paranoid ideation (d6); sleeping problems (d7); and somatisation (d8). The total score is used to assess the level of general psychological distress. Although the SCL-90 was originally developed for psychiatric outpatients, it has been used in several settings (e.g. primary care, general population and chronic pain patients), and has proved to have good-to-excellent psychometric properties and reliable norm groups available (Arrindell & Ettema, 2003).

Experiences during deployment

In a questionnaire developed specifically for the PRISMO research, 19 types of events that can be experienced during deployment are assessed (i.e. shooting aimed at you, being injured, seeing dead people, no control over the situation). These events can potentially be traumatic. The dichotomous answer possibilities are whether the person has experienced the event or not.

2.4 Statistical analyses

For assessing the statistical analyses the statistical package SPSS version 12.0 was used. Assumptions of normality were tested. Because the DS14 is a relatively new questionnaire, first the reliability was computed, using Cronbach's α . Subsequently a factor analysis was carried out to see if the questionnaire really measures the two underlying components Negative Affectivity (NA) and Social Inhibition (SI). The 14 items of the DS14 subscales Negative Affectivity (NA) and Social Inhibition (SI) were subjected to principal component analyses (PCA). Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .90, exceeding the recommended value of .6 and Bartlett's Test of Sphericity reached statistical significance. These tests supported the factorability of the correlation matrix.

To compare the percentage of the group of type D personality in our population with the percentage in the general Dutch population (28%) (Denollet, 2005), a chi-square for goodness-of-fit was performed. To analyze differences over time (two measurements) between the percentages of type D personality within the research population, a bivariate regression analysis, a binomial test and chi-squares were conducted.

To test if there were differences in the level of symptoms between the groups with and without type D personality, a mixed between-within subjects ANOVA was accomplished. First tests were conducted to assess if there were differences in age, number of different events, number of previous deployments and military rank. Since there were no significant differences these results were not taken into account in further analyses. Subsequently the differences between the groups non-type D and type D on the SCL-90 total score and on the seven subscales of the SCL-90 were analyzed. Mixed between-within subjects ANOVA's were conducted to assess the impact of type D personality on level of symptoms across two time periods (pre- and post deployment). Because of the large sample size ($n > 30$, Pallant, 2007), the tests that were used were robust for violation of assumptions.

To test the hypothesis that type D personality predeployment is a predictor of the level of symptoms post deployment, correlations between the SCL 90 as a whole, the seven subscales and type D personality predeployment, were obtained. Furthermore, a hierarchical regression analysis was accomplished to test the predictive value of type D personality on the total SCL-90 score and its subscales at one month post deployment, controlled for the level of symptoms predeployment.

3. Results

3.1 Reliability and factor analyses DS14

Reliability

The scales Negative Affectivity and Social Inhibition of the DS14 had very good internal consistency. The Cronbach's α for the two measurements are presented in Table 2.

Table 2

Reliability of the DS14

Measurement	Negative Affectivity α	Social Inhibition α	DS14 α
Time 1	.85	.89	.90
Time 2	.86	.85	.89

Note. *Time 1 is measurement predeployment. Ttime 2 is post deployment.*

Factor Analyses

PCA revealed the presence of two components with eigenvalues exceeding 1. An inspection of the screeplot revealed a reasonable clear break after the second component. The two-component solution explained a total of 60.0% of the variance, with component 1 contributing 44.1 % and component 2 contributing 16.0%. To aid in the interpretations of these two components, oblimin rotation and varimax rotation were performed. The rotated solution revealed the presence of a simple structure, with both components showing a number of strong loadings and all variables loading strongly to the component it belonged to. An exception was item number 6 which belongs to SI ('I often feel inhibited in social interaction'). This item loaded stronger on component 1 (NA) than on component 2 (SI) for oblimin and varimax rotation. There was a moderate negative correlation between the two factors ($r = -.36, p < .001$). Because the purpose of this thesis was to evaluate the type D personality construct on military personnel and not to adapt the construct, we chose to leave in component 2 (SI) for further analyses. Table 3 presents the pattern and structure matrix for PCA. For the screeplot and the unrotated loading, see appendix 2.

Table 3

Pattern and structure matrix for PCA with Oblimin Rotation of Two Factor Solution of DSI4 items.

Item	Pattern coefficients		Structure coefficients		communalities
	Component 1	Component 2	Component 1	Component 2	
7. Gloomy view	.831	-.055	.850	-.352	.726
13. Down	.806	.063	.783	-.225	.617
5. Irritated	.799	.093	.773	-.531	.594
9. Bad mood	.743	-.085	.766	-.193	.604
12. Worrying	.683	-.160	.740	-.405	.570
4. Unhappy	.682	.079	.701	-.573	.433
6. social interactions	.569	-.370	.654	-.165	.611
2. Unimportant things	.461	-.011	.465	-.176	.217
1r. Contact	-.103	-.897	.218	-.860	.748
3r. Talk to strangers	-.260	-.849	.399	-.812	.630
10. Closed	.125	-.767	.408	-.788	.673
8. Start conversation	.144	-.736	.544	-.784	.639
11. Distance	.246	-.686	.492	-.774	.652
14. Talk about things	.303	-.675	.044	-.755	.694

Note. Major loadings for each item are bolded.

3.2 Type D personality

A chi-square for goodness-of-fit test indicated there was a significant difference in the proportion of type D personality identified in the current sample (15.7%) as compared with the normal population value of 28% (Denollet, 2005), that was obtained in a previous described study ($\chi^2(1) = 15.34, p < .001$).

For the subscale Negative Affectivity (NA) there was a correlation of .73 ($p < .001$) between the scores predeployment and post deployment. For the subscale Social Inhibition (SI) the correlation was .76 ($p < .001$). Paired sample t-tests revealed that there were no significant differences between pre- and post deployment (NA: $\mu = 5.85$ (sd 4.6) vs. $\mu = 5.59$ (sd 4.5) $p = n.s.$, SI: $\mu = 8.46$ (sd 6.15) vs. $\mu = 8.75$ (sd 5.77) $p = n.s.$); NA and SI remained stable over time.

For testing the stability of type D, a non-parametric bivariate correlation was used. There was a high correlation between pre- and post deployment (Spearman's $r = .64$, $p < .001$). The percentage of type D personality at pre- and post deployment was 15.7% ($N = 204$) and 17.3% ($N=185$) respectively. Since there was a non-normal distribution, the non-parametric binomial test was used to assess the statistical difference between the percentage of type D personality. There was no difference between the two percentages ($p = .30$). On the dichotomous NA scale and SI scale, the percentages also did not change significantly over time either ($p = .52$ and $.41$ respectively). Investigating the crosstabs revealed that some individuals switched groups during deployment, but the group as a whole was stable (Table 4). All individuals that lost the type D classification during deployment had visually lower scores on NA after deployment, SI was relatively stable. Individuals that became type D personality had higher scores on both subscales.

Table 4

Percentages of type D, NA and SI

	N T1	% T1	N T2	% T2	N ^{stable}	N ^{became}	N ^{lost}
Type D	24	15.7	24	17.3	17	7	7
Type NA	35	23.0	34	22.8	22	12	13
Type SI	60	39.5	59	38.4	46	13	14

Note T1 is measurement 1, T2 is measurement 2. 'became' refers to the number of people that became the type during deployment, 'lost' refers to the number of individuals that had the type before deployment, but did not reach the cut off after deployment.

3.3 Differences between type D and non-type D

There were no differences between individuals with type D and individuals without type D on age, number of previous deployments, number of different events or military rank (Table 5).

Table 5

Differences between individuals with and without type D.

	Non-type D	Type D	Test value	P value
Age ^a	27.65 (7.8)	27.19 (9.1)	U = 2529	.684
Number of events ^b	6.20 (3.1)	6.57 (2.9)	t = -.506	.614
Previous deployment ^c	1.14 (1.3)	1.00 (1.1)	$\chi^2 = .086$.770
Rank ^c			$\chi^2 = .615$.960
Soldier	85.2%	14.8%		
Corporal	85.4%	14.6%		
N.C. officer	85.7%	14.3%		
Subaltern Officer	80.0%	20.0%		
Flag officer	90.0%	10.0%		

Note. a. Mann-Whitney U test.

b. t-test.

c. Chi-square.

There was no main effect for time on the level of symptoms. The main effect comparing the type D and non-type D on the other hand was significant. This reveals that there was a difference in level of symptoms between type D and non-type D on both times. There was no interaction effect between type D personality and time. Subsequently, the seven subscales on the Symptom Checklist 90 were investigated using a mixed between-within subjects analysis of variance (Table 7, plots appendix 3).

There was a significant main effect for type D on all subscales (this implicates that within these subscales there was a difference in the level of symptoms between type D and non-type D between pre- and post deployment). The type D group scored significantly higher on the subscales than the non-type D group. For the subscale 'interpersonal sensitivity and paranoid ideation' there also was a significant main effect for time, showing that the type D *and* the non-type D groups became more interpersonal sensitive as a consequence of deployment (Figure 1). The scale, 'sleeping problems' was significant for both the main effects and the interaction effect. The type D group scored higher on sleeping problems as a result of the type D qualification *and* had higher scores after deployment (Figure 2).

Table 7

Analysis of variance to assess the impact of type D on level of symptoms

Effects	M type D T1 (sd)	M non-type D T1(sd)	M type D T2 (sd)	M type D T2 (sd)	F ratio	<i>p</i>	η^2
SCL total score	117.10 (25.9)	99.47 (9.6)	117.25 (20.5)	99.88 (13.0)	.03	.86	.00
Type D					36.44	< .01	.20
Symptoms x type D					.01	.94	.00
Phobia	8.18 (2.3)	7.05 (0.3)	8.09 (1.8)	7.24 (0.7)	.19	.66	.00
Type D					28.00	< .01	.16
Phobia x type D					1.68	.19	.01
Anxiety	13.36 (3.3)	10.76 (1.3)	13.05 (3.5)	10.77 (1.4)	.71	.40	.01
Type D					41.92	< .01	.22
Anxiety x type D					.86	.35	.01
Depression	21.14 (5.5)	17.51 (2.4)	20.86 (5.1)	17.68 (3.5)	.02	.89	.00
Type D					24.37	< .01	14.1
Depression x type D					.32	.57	.00
Somatisation	16.64 (4.1)	13.52 (2.2)	15.68 (3.0)	13.68 (2.2)	1.86	.18	.01
Type D					28.10	< .01	.16
Somatisation x type D					3.80	.05	.03
Insufficiency	13.52 (4.2)	10.66 (2.4)	14.05 (4.8)	10.55 (2.5)	.47	.50	.00
Type D					29.10	< .01	.17
Insufficiency x type D					.30	.30	.01
Interpersonal	22.57 (5.9)	18.84 (2.2)	24.05 (5.3)	20.27 (3.7)	12.47	< .01	.08
Type D					28.31	< .01	.16
Interpersonal x type D					.00	.96	.00
Hostility	7.76 (2.2)	6.89 (1.5)	8.43 (2.2)	6.86 (1.4)	2.55	.11	.02
Type D					15.79	< .01	.10
Hostility x type D					2.93	.09	.02
Sleeping problems	4.30 (1.7)	3.86 (1.5)	5.30 (2.4)	4.08 (1.7)	9.58	< .01	.06
Type D					6.68	.01	.04
Sleeping x type D					4.07	.045	.03

Note. T1 is predeployment, T2 is postdeployment, SCL total score is general level of symptoms on the SCL-90, phobia is the score on the subscale phobic symptoms, anxiety is the score on general anxiety symptoms, depression is the score on the subscale depressive symptoms, hostility is the score on the subscale hostility, inadequacy is the score on the subscale inadequacy of thought and action, interpersonal is the score on the subscale interpersonal sensitivity and paranoid ideation, sleeping is the score on the subscale sleeping problems and somatisation is the score on the subscale somatisation.

Figure 1 *subscale interpersonal sensitivity and paranoid ideation*

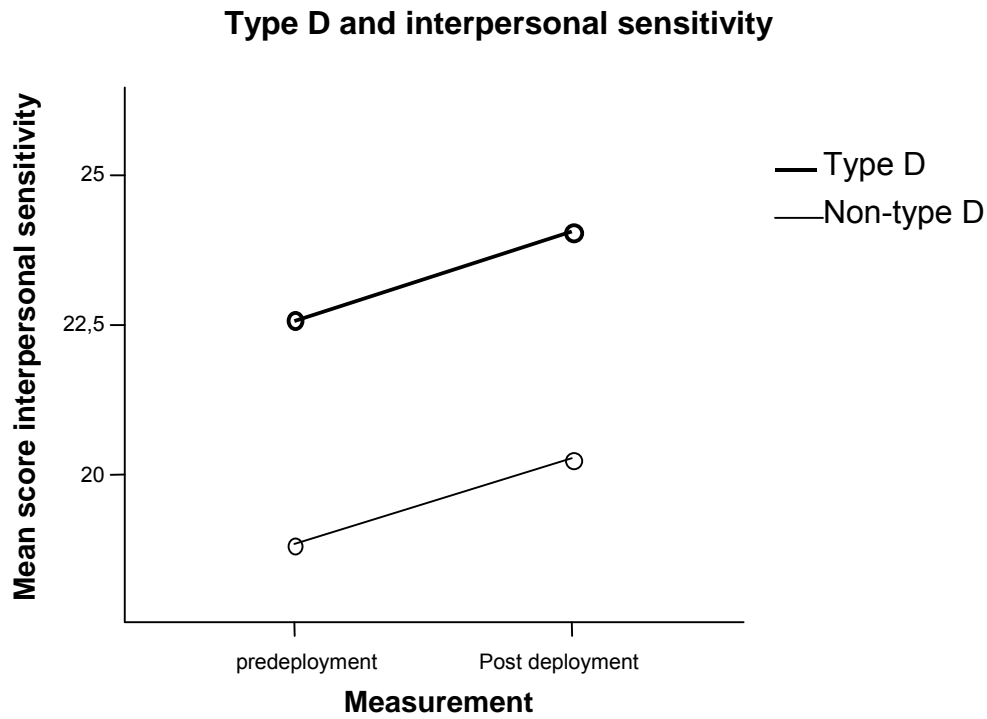
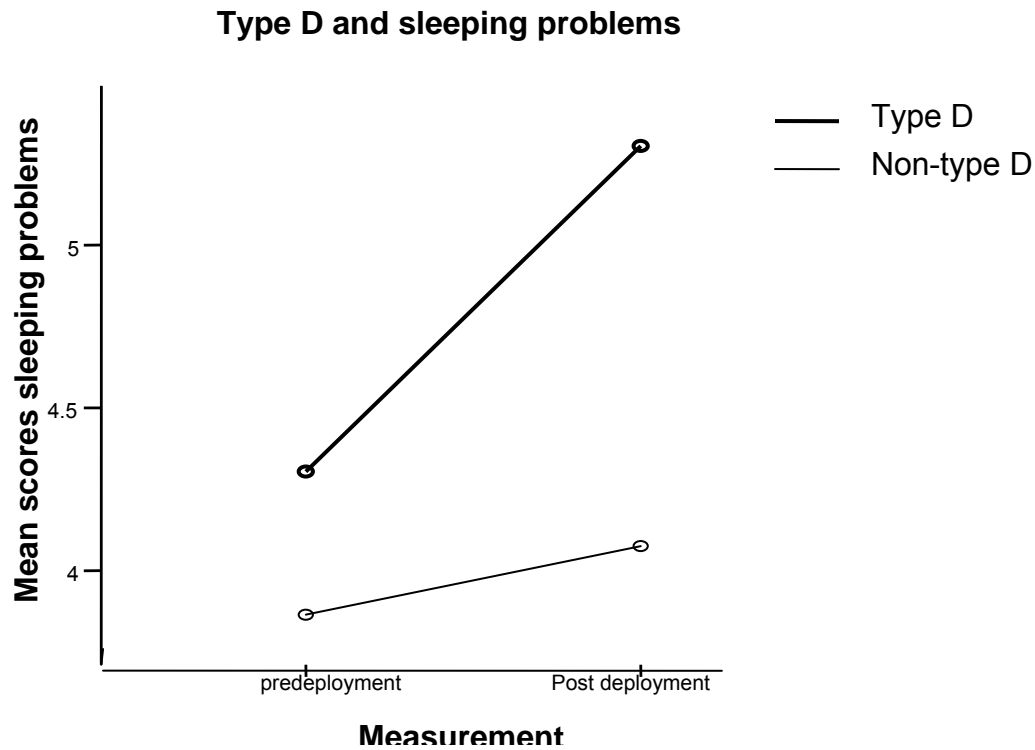


Figure 2 *sleeping problems*



3.4 Type D as predictor of symptoms

First the correlations between type D personality and level of symptoms were investigated using Pearson's r (Table 8). There was a large positive correlation ($r=.60, p <.001$) between general level of symptoms predeployment and general level of symptoms post deployment. Type D predeployment was moderately associated with level of symptoms post deployment ($r=.47, p <.001$). Analysis showed that there was one small negative correlation ($r = -.16$) between symptoms predeployment and age. Correlations between age or number of different events exposed to during deployment and symptoms post deployment were not significant. Therefore, these variables were not included in the hierarchical regression. The correlations between type D and the scores on the subscales were all significant. There were positive small to medium correlations (Table 8).

Subsequently hierarchical regression was used to assess the ability of type D personality as measured predeployment, to predict the level of symptoms post deployment, where controlling for the level of symptoms predeployment. On the SCL total score, level of symptoms before deployment explained 34.8% of the variance post deployment. After entering presence of type D at time 1, an additional 1.9% ($p <.05$) was explained.

To investigate if type D personality was a unique predictor for the separate SCL-90 subscales, hierarchical regressions were conducted on type D measured predeployment and the seven subscales separately. On the subscales hostility (r^2 change 7.2%, $p <.01$), sleeping problems (3.4%, $p <.01$), general anxiety (2.5%, $p <.01$) and inadequacy of thought and action (1.7%, $p <.05$), type D personality made a significant unique contribution, where controlling for the scores on the specific subscales predeployment. type D did not add a unique contribution on the other subscales (phobic anxiety, depression and interpersonal sensitivity and paranoid ideation) (Table 9).

Table 8

Correlation matrix on type D and SCL-90

(sub)Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1 type D T1	-																				
2 symptoms T1	.48**	-																			
3 symptoms T2	.41**	.40**	-																		
4 age	-.02	-.08	-.16*	-																	
5. events	.04	.14	.14	-.13	-																
6 phobia T1	.40**	.15*	.58**	.04	.04	-															
7 phobia T2	.25**	.51**	.28**	.05	.06	.55**	-														
8 Anxiety T1	.41**	.46**	.83**	-.03	.07	.50**	.36**	-													
9 Anxiety T2	.40**	.78**	.55**	-.11	.10	.44**	.49**	.62**	-												
10 Depression T1	.41**	.52**	.87**	-.05	.18*	.46**	.25**	.72**	.53**	-											
11 Depression T2	.29**	.86**	.41**	-.07	.03	.24**	.37**	.37**	.68**	.56**	-										
12 Somatic T1	.43**	.48**	.75**	-.12	.06	.49**	.39**	.63**	.46**	.62**	.38**	-									
13 Somatic T2	.34**	.64**	.45**	.13	.12	.34**	.41**	.44**	.51**	.47**	.53**	.51**	-								
14 Inadequacy T1	.42**	.54**	.84**	-.08	.05	.44**	.55**	.69**	.55**	.71**	.49**	.58**	.39**	-							
15 Inadequacy T2	.39**	.83**	.47**	-.14	.04	.27**	.41**	.46**	.73**	.50**	.73**	.37**	.52**	.37**	-						
16 Interperson T1	.46**	.51**	.87**	.00	.06	.60**	.35**	.68**	.57**	.77**	.45**	.56**	.38**	.69**	.47**	-					
17 Interperson T2	.33**	.87**	.54**	-.14	.08	.26**	.50**	.38**	.71**	.44**	.65**	.32**	.49**	.47**	.52**	.56**	-				
18 Hostility T1	.25**	.33**	.67**	-.21**	.16*	.30**	.16*	.54**	.32**	.44**	.19**	.43**	.21**	.50**	.23**	.51**	.26**	-			
19 Hostility T2	.37**	.70**	.45**	-.17*	.06	.09	.37**	.28**	.55**	.37**	.57**	.29**	.37**	.35**	.68**	.37**	.65**	.39**	-		
20 Sleeping T1	.14*	.28**	.52**	.03	.09	.19**	.10	.33**	.18*	.39**	.19**	.37**	.23**	.34**	.14	.29**	.14*	.28**	.24**	-	
21 Sleeping T2	.21**	.63**	.33**	.04	.10	.07	.20**	.16*	.39**	.27**	.45**	.21**	.42**	.27**	.42**	.21**	.40**	.12	.38**	.46**	-

** p <.01 (two-tailed), * p <.05 (two-tailed)

note. T1 is measurement predeployment, T2 is measurement post deployment. Age is the average age of the population, events are the number of different events exposed to during the mission Symptoms is general level of symptoms total score on the SCL-90, phobic anxiety is the score on the subscale phobic symptoms, general anxiety is the score on anxiety symptoms, depression is the score on the subscale depressive symptoms, hostility is the score on the subscale hostility, inadequacy is the score on the subscale inadequacy of thought and action, interperson is the score on the subscale interpersonal sensitivity and paranoid ideation, sleeping is the score on the subscale sleeping problems and somatic is the score on the subscale somatisation.

Table 9

Summary of hierarchical regression analyses for variables predicting level of symptoms per subscale post deployment (T2) (N=155)

	df	F	β	R ²	% change
Step 1: symptoms T1	1, 144	81.95	.602	.363	
Step 2: symptoms T1	2, 143	44.06	.528	.381	1.9*
Type D T1			.155		
Step 1: Phobic anxiety T1	1, 153	64.95	.546	.298	
Step 2: Phobic anxiety T1	2, 152	32.94	.517	.302	0.0
Type D T1			.072		
Step 1: General anxiety T1	1, 150	92.26	.617	.381	
Step 2: General anxiety T1	2, 149	50.88	.544	.407	2.6**
Type D T1			.174		
Step 1: Depression T1	1, 152	70.87	.564	.318	
Step 2: Depression T1	2, 151	36.12	.529	.324	0.1
Type D T1			.083		
Step 1: Somatisation T1	1, 153	54.13	.511	.261	
Step 2 : Somatisation T1	2, 152	28.79	.456	.275	1.3
Type D T1			.128		
Step 1: Inadequacy T1	1, 152	99.76	.629	.396	
Step 2: Inadequacy T1	1, 151	53.16	.564	.413	1.7*
Type D T1			.146		
Step 1: Interpersonal T1	1, 152	68.23	.557	.310	
Step 2: Interpersonal T1	2, 151	35.05	.512	.317	0.1
Type D T1			.096		
Step 1: Hostility T1	1, 153	27.84	.392	.154	
Step 2: Hostility T1	1, 152	22.19	.324	.226	7.2**
Type D T1			.277		
Step 1: Sleeping problems T1	1, 155	40.76	.456	.208	
Step 2: Sleeping problems T1	1, 154	24.68	.429	.243	3.4*
Type D T1			.188		

** p <.01 (two-tailed), * p <.05 (two-tailed)

note. Symptoms is general level of symptoms total score on the SCL-90, phobic anxiety is the score on the subscale phobic symptoms, general anxiety is the score on anxiety symptoms, depression is the score on the subscale depressive symptoms, hostility is the score on the subscale hostility, inadequacy is the score on the subscale inadequacy of thought and action, interpersonal is the score on the subscale interpersonal sensitivity and paranoid ideation, sleeping is the score on the subscale sleeping problems and somatisation is the score on the subscale somatisation.

Discussion

In this longitudinal study type D personality has been analyzed as predicting risk factor for elevated levels of physical and psychological symptoms after military deployment. Type D, consisting of both the personality traits Negative Affectivity (NA) and Social Inhibition (SI) can be seen as a personality style whereby the individual constantly experiences elevated levels of distress. For the development and selection criteria for preventive programs aimed at reducing stress levels, more scientific knowledge about risk factors is required. There are three forms of prevention; primary prevention to detect vulnerabilities predeployment, secondary prevention where signals are identified before symptoms are visible and tertiary prevention to effectively treat symptoms to prevent them from becoming chronic (www.prismo.nl). Several aspects of the type D construct (reliability, stability over time, prevalence and association with symptoms predeployment) were studied before the analysis concerning type D as a risk factor predicting elevated levels of psychological symptoms post deployment.

4.1 Reliability, stability and prevalence

The DS14 was found to be a reliable questionnaire in this military sample for both the subscales Negative Affectivity and Social Inhibition as well as for the total DS14 scale. In a factor analysis the two constructs found by Denollet (2005), NA and SI, were replicated, except for one item (item 6; I often feel inhibited in social interactions). Because the DS14 is a relatively new questionnaire, it is recommended to repeat the factor analysis to investigate the role of this item in the scale in other cohorts.

The prevalence of type D personality pre- and post deployment proved to be stable. After deployment, the percentage of type D in this sample had not significantly changed. The hypothesis of the construct type D as a personality trait and not a state was supported (Denollet, 2005). In contrast to the findings of Bramsen et al. (2002) in their military sample on the change of the personality trait neuroticism (measured with the NEO-PI-R) after deployment, type D personality change did not appear to occur in this current study. These different results could be explained by the fact that Bramsen et al. (2002) studied their group 50 years after the war was over and that they reported a high amount of war time stress, whereas the current thesis studied a group of healthy individuals directly after deployment and did not select on exposure to a high amount of war time stress. Longitudinal follow up studies can give us insight in the effects on the long term stability of type D personality. Another explanation can be that personality appears to stay stable over time in

healthy individuals, but can change under the influence of or as a co-occurrence of a psychological disorder. However, Srivastava et al. (2003) found personality to vary during adulthood. Further research therefore is recommended, to investigate in healthy individuals whether NA and SI really are stable over a longer time period and are not subject to change.

The percentages of type D were significantly lower than in the studies by Denollet (2005) and Williams (2008) in the general population. Although this finding supports the hypothesis that type D personality is less prevalent in male military groups compared to the general population, type D was present (15.3%) and can be analyzed as a risk factor for mental health problems.

A remarkable finding is that the percentages of the subscales NA and SI are considerable higher than the percentage of the combined type D personality, 23.0% and 39.5% respectively. Although higher scores on one subscale is not seen as problematic in the concept of Denollet (2005), having a negative view on the world on itself can become problematic if you have to adapt to different situations. Almost 40% of the group is categorized as a closed person in social interactions, so the chance of a climate in which open communication and talking about your feelings is accepted, is less likely to be present. This can become problematic in situations where traumatic events happened because it can be important to talk about feelings and thoughts about the event. Further research is necessary to investigate the effects of the high percentages of the subscales on a longer term post deployment.

4.2 Predeployment in association with symptoms

As in the study of De Fruyt and Denollet (2002) on healthy individuals, higher elevated levels of symptoms were indeed found in type D personality military personnel. At predeployment individuals classified as type D personality had a significantly higher level of symptoms compared to persons classified as non-type D.

4.3 Prospective value of type D

The main question of this study concerned the predictive value of type D personality as risk factor for mental health problems post deployment. The results indicated that individuals classified as type D experienced significantly higher symptom levels post deployment. In itself this would support the main hypothesis of type D as a risk factor for mental health problems.

The hypothesis that deployment triggers a psychological vulnerability however was not supported. The idea is that personality traits, such as type D or neuroticism can become problematic if a life

event happened (Barlow, 2002). This did not seem to be true for the type D group in this cohort, the elevated level of symptoms was present predeployment. So for most symptoms deployment as such did not reveal any elevated symptom levels. Exceptions were only found on the SCL-90 subscales 'interpersonal sensitivity and paranoid ideation' and 'sleeping problems' which showed an effect of time and therefore deployment seemed to elevate these specific symptoms for all military personnel.

For persons with D-personality only for sleeping problems, an interaction effect was found, suggesting that type D personality was an extra risk factor for elevated vulnerability post deployment.

Overall, for type D persons, symptoms hardly increased post deployment. This is an important prospective finding because it shows that although individuals with a type D personality are generally more distressed and therefore start at a higher baseline than individuals without type D personality, there is almost no effect of deployment.

Considering the subscales of the SCL-90 post deployment, after controlling for level of symptoms on the specific subscale predeployment, type D personality made the largest prospective prediction at the hostility scale, 7.2%. It also had a unique contribution on sleeping problems (3.4%), general anxiety (2.5%) and inadequacy of thought and action (1.7%). The association between type D and problems concerning depressive symptoms, as suggested by Pedersen and Denollet (2004) was not found in this population. Possibly, type D personality only predicts sleeping problems and inadequacy of thought and action as depressive symptoms. Another possibility is that the SCL-90 is not an adequate measurement for depression.

Although type D is prevalent within military personnel and is indeed associated with an elevated level of symptoms, the mean of SCL-symptoms of the group classified as type D personality matched with the category 'average' of the Dutch general population (Arrindell & Ettema, 2003) and therefore is not at this point clinically problematic. This finding implies that in general military personnel does not experience a lot of physical and psychological symptoms and can be seen as a (mentally) healthy population compared to the average Dutch population. Therefore one could defend the opinion that type D personality does not have to be classified as 'problematic' within a military population because this group is on the average level of the general Dutch population. Another important finding is that the non-type D group experiences symptoms on the level of 'below

average' compared to the Dutch norm and could therefore be regarded as a group that is resilient to symptoms (Arrindell & Ettema, 2003).

While this would suggest type D to be a risk factor, controlling for level of predeployment symptoms in hierarchical regression analyses showed the influence of type D to explain an additional 2% of SCL-90 total symptoms. Therefore type D personality significantly and uniquely predicted post deployment symptoms.

4.4 Usefulness of type D as predictor pre deployment

Although the predicting results of type D were significant, the question remains what the clinical implications are, since an additional 2% predictive value is very small. A suggestion is that the DS14 could be used as a very short tool to screen which individuals will experience elevated symptoms post deployment. The longer SCL-90 checklist will not be necessary at the moment of screening military personnel for primary or secondary prevention programs. Further longitudinal research is needed to test whether the predictive value of type D personality becomes more clinically relevant when following participants for a longer time period post deployment.

The concept also can be used in military or general treatment settings. If a person has a negative affect and is socially inhibited, the individual approach can be modified to this and the individual can be learned skills to deal with his social inhibition and cognitive treatment to change his negative world view and view of himself. Group therapy can be helpful in learning and practicing social skills.

4.5 Strengths and limitations

Strengths of this study are the large sample size, the longitudinal survey design and the simplicity of the use of only one personality and symptoms questionnaire. Although type D personality is assessed with a short list, research in several samples comparing the DS14 with other personality measures as the NEO-FFI was promising. In upcoming research it will be useful to compare the type D personality with other personality questionnaires such as the NEO-FFI or the Temperament and Coping Inventory (TCI) in military personnel as well.

A general limitation of the study was that only male participants were included and the short time period between the end of deployment and the measurement post deployment (approximately 1-2 months).

The type D concept has its limitations. Because of the hard cut-off points (both scales >10) it is difficult to make clinical implications based solely on this questionnaire. A high level of Negative Affectivity without Social Inhibition and vice versa is not considered problematic in the construct of Denollet (2005) but can be seen as problematic or difficult to live with for an individual. By example, Negative Affectivity is seen as a trait that can predispose for different psychological problems (Watson & Clark, 1984).

4.6 Conclusions

This study has succeeded in exploring the possible functions of assessing type D in a military cohort. Type D personality can be useful in predicting scores on general symptoms, and more specifically on anxiety, sleeping problems, inadequacy in thought and action and hostility. Type D personality predicted a unique, but small percentage of the level of symptoms within a month after deployment. However, the elevated level of overall symptoms reported by type D classified individuals were not a consequence of deployment in itself but existed beforehand. Only for the subscales ‘interpersonal sensitivity and paranoid ideation’ and ‘sleeping problems’ type D was a risk factor triggered by deployment.

4.7 Recommendations

For future research it is important to repeat these analyses including later measurements (after six months, one year, 2, 5 and 10 years) in the PRISMO study, because prolonged effects can be taken into account. If the unique predictive value of type D personality increases over time, it can be helpful in military mental health care to screen for type D pre- or post deployment and to offer preventive programs for this specific group.

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Appendix 1 DS14 questionnaire

DS 14 Name: Today's date:

Below are a number of statements that people often use to describe themselves. Please read each statement and then circle the appropriate number next to that statement to indicate your answer.

There are no right or wrong answers: your own impression is the only thing that matters.

0=false 1=rather false 2=neutral 3=rather true 4=true

1. I make contact easily when I meet people	0	1	2	3	4
2. I often make a fuss about unimportant things	0	1	2	3	4
3 I often talk to strangers	0	1	2	3	4
4. I often feel unhappy	0	1	2	3	4
5. I am often irritated	0	1	2	3	4
6. I often feel inhibited in social interactions	0	1	2	3	4
7. I take a gloomy view of things	0	1	2	3	4
8. I find it hard to start a conversation	0	1	2	3	4
9. I am often in a bad mood	0	1	2	3	4
10. I am a closed kind of person	0	1	2	3	4
11. I would rather keep other people at a distance	0	1	2	3	4
12. I often find myself worrying about something	0	1	2	3	4
13. I am often down in the dumps	0	1	2	3	4
14. When socializing, I don't find the right things to talk about	0	1	2	3	4

Scoring of the DS14.

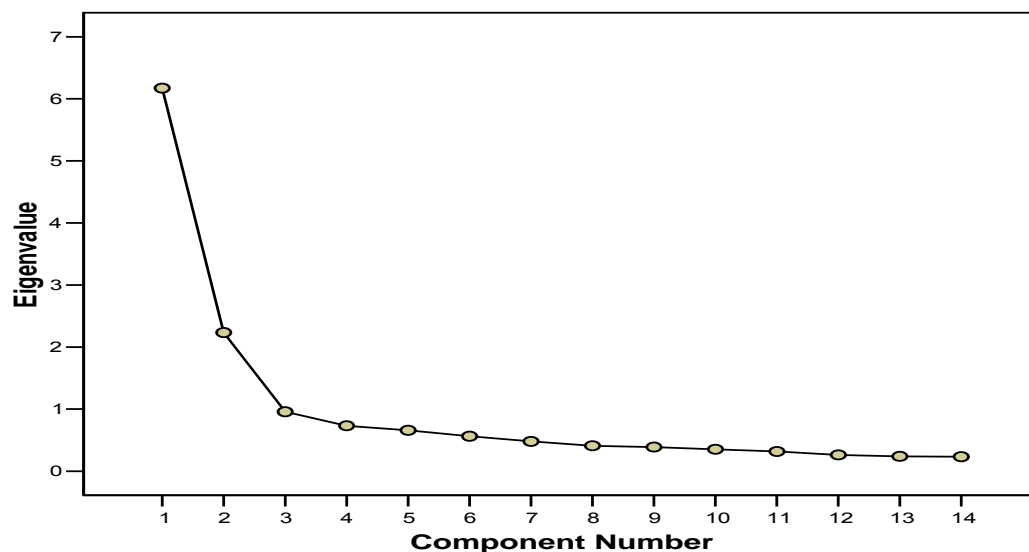
Scoring of Negative Affectivity and Social Inhibition scales can be used as continuous variables to assess each of these two personality traits in their own right. Scores on both scales range from 0-28, and can be calculated as follows.

Negative Affectivity = sum of scores on items 2 + 4 + 5 + 7 + 9 + 12 + 13.

Social Inhibition = sum of scores on items 1 (reversed) + 3 (reversed) + 6 + 8 + 10 +
11 + 14.

Appendix 2

Scree Plot

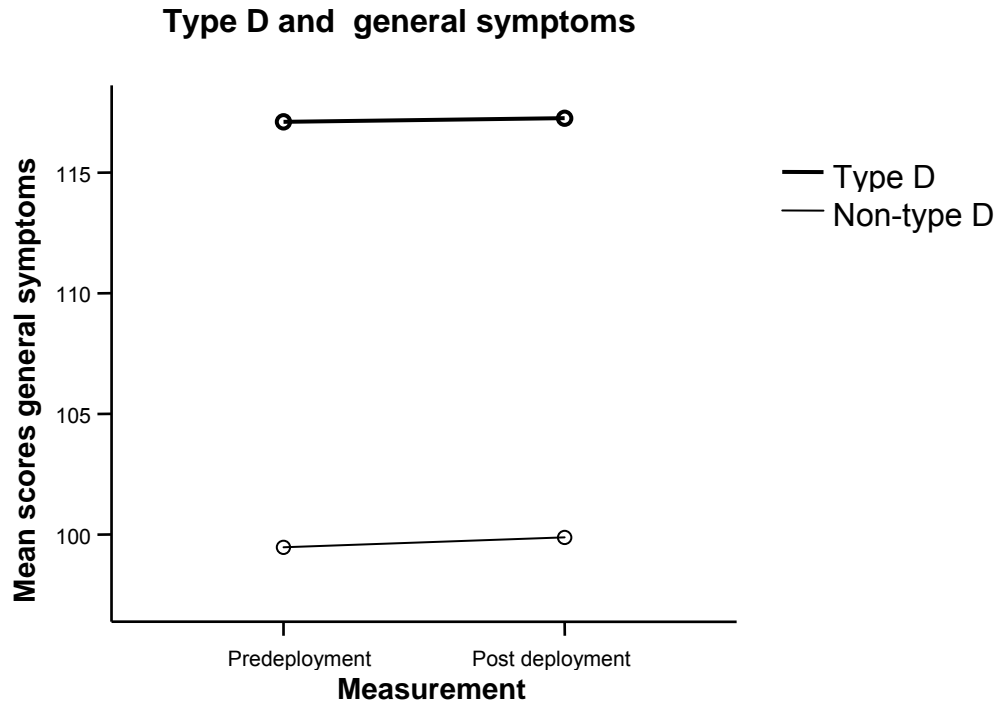


Component Matrix(a)

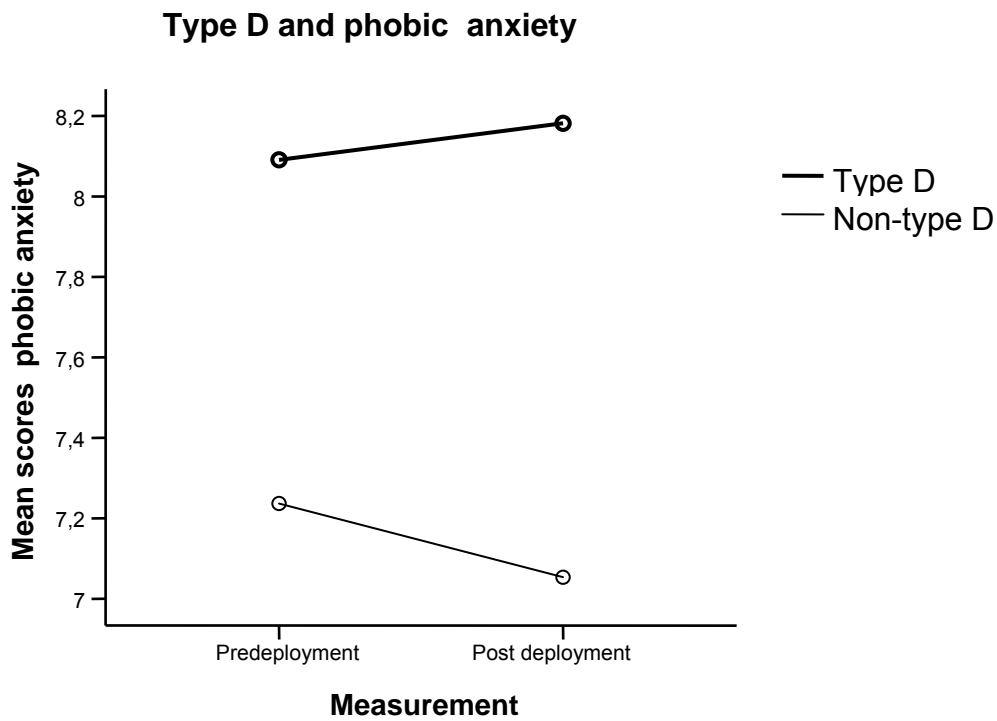
	Component	
	1	2
14 Ik weet niet waarover ik moet praten met anderen	.792	-.258
6 Ik voel me vaak geremd in de omgang met anderen	.778	.067
7 Ik zie de zaken somber in	.754	.396
11 Ik houd andere mensen liefst wat op een afstand	.752	-.293
10 Ik ben een gesloten persoon	.712	-.406
12 Ik maak me dikwijls zorgen	.711	.255
8 Ik vind het moeilijk om een gesprek te beginnen	.705	-.377
9 Ik ben vaak slecht gehumeurd	.703	.333
13 Ik zit vaak in de put	.639	.456
1r Ik maak gemakkelijk contact met mensen	.620	-.603
5 Ik ben vaak geïrriteerd	.611	.470
4 Ik voel me vaak ongelukkig	.521	.402
2 Ik maak me dikwijls druk over onbelangrijke zaken	.404	.232
3r Ik maak vaak een praatje met onbekenden	.447	-.655

Extraction Method: Principal Component Analysis.
a. 2 components extracted.

SCL 90 total

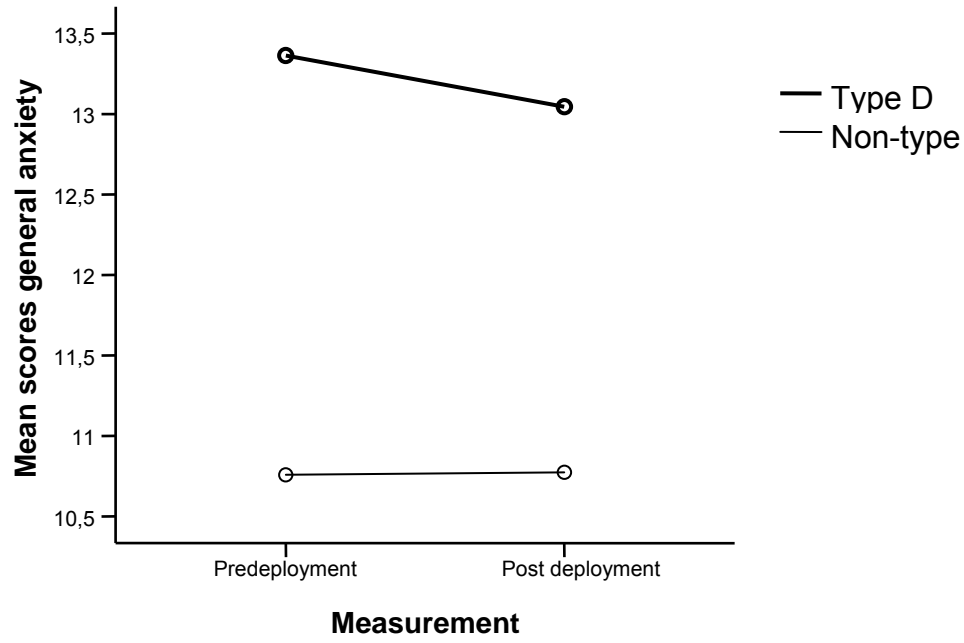


Subscale phobic anxiety



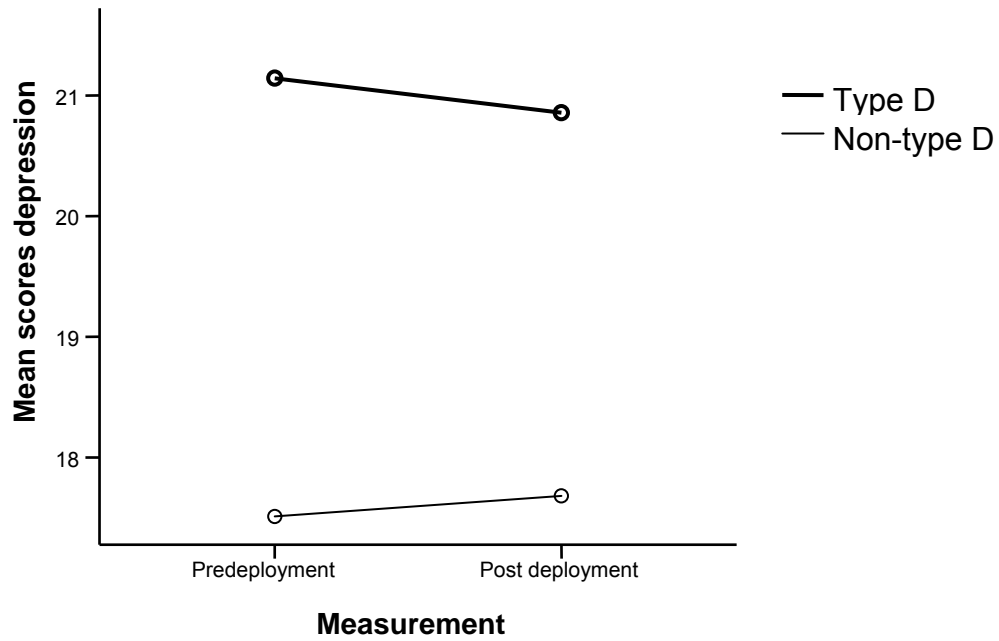
Subscale general anxiety

Type D and general anxiety

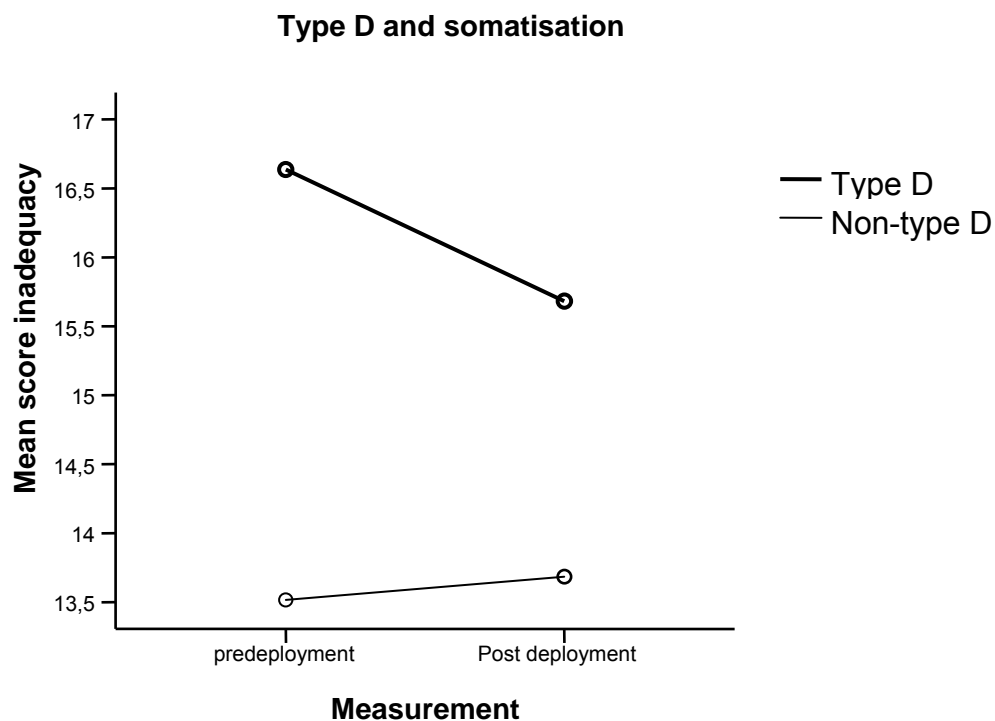


Subscale depression

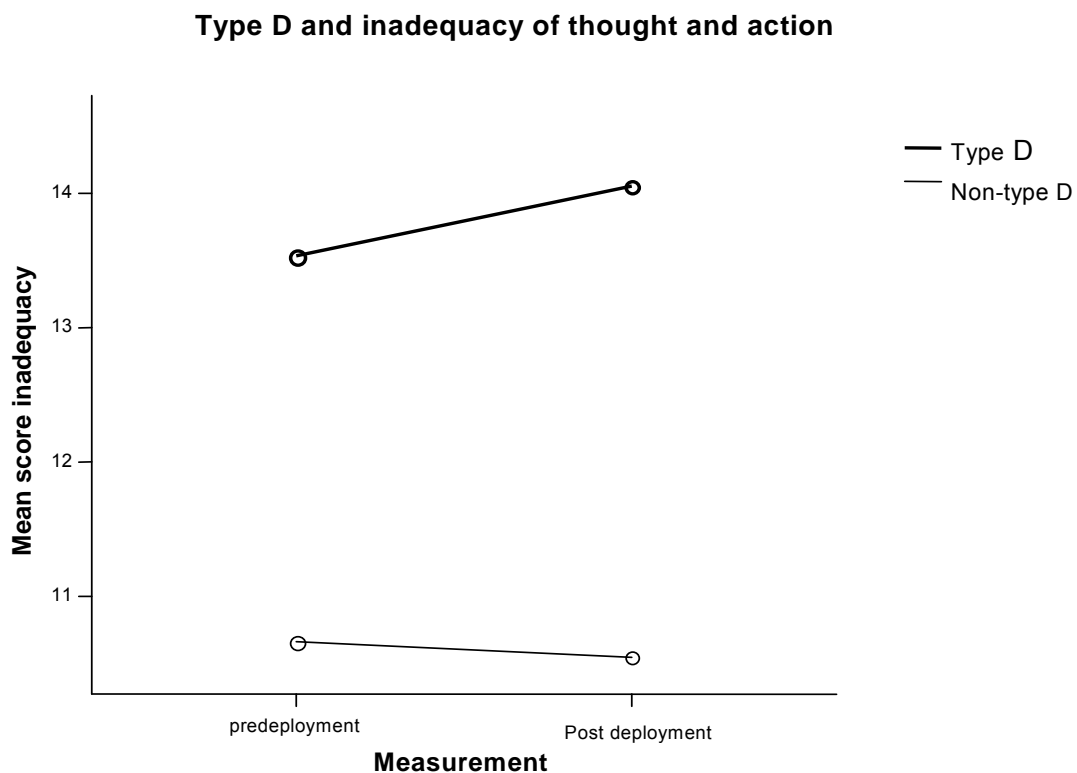
Type D and depression



Subscale somatisation

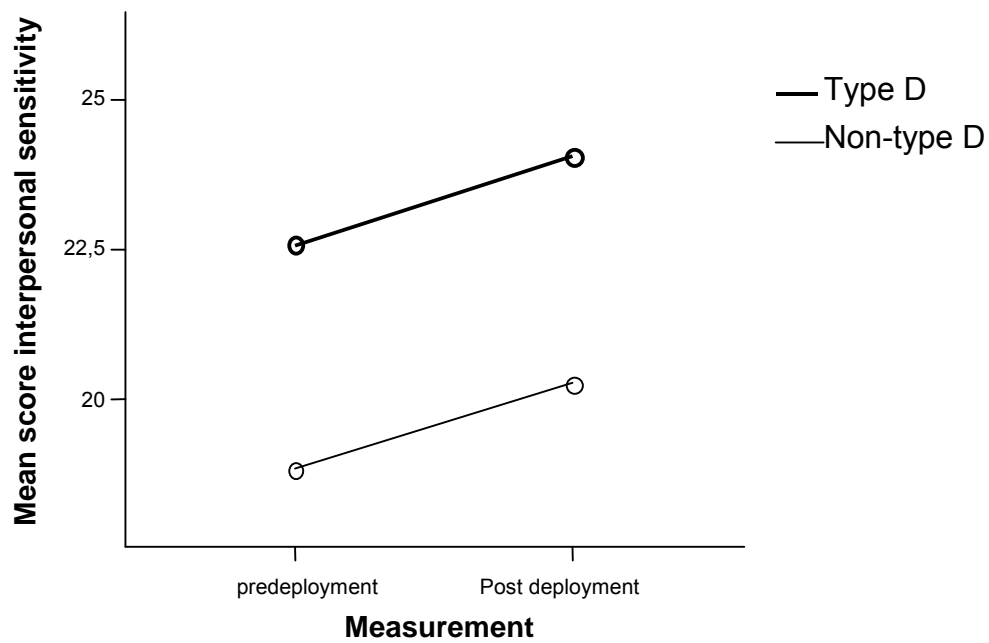


Subscale inadequacy of thought and action



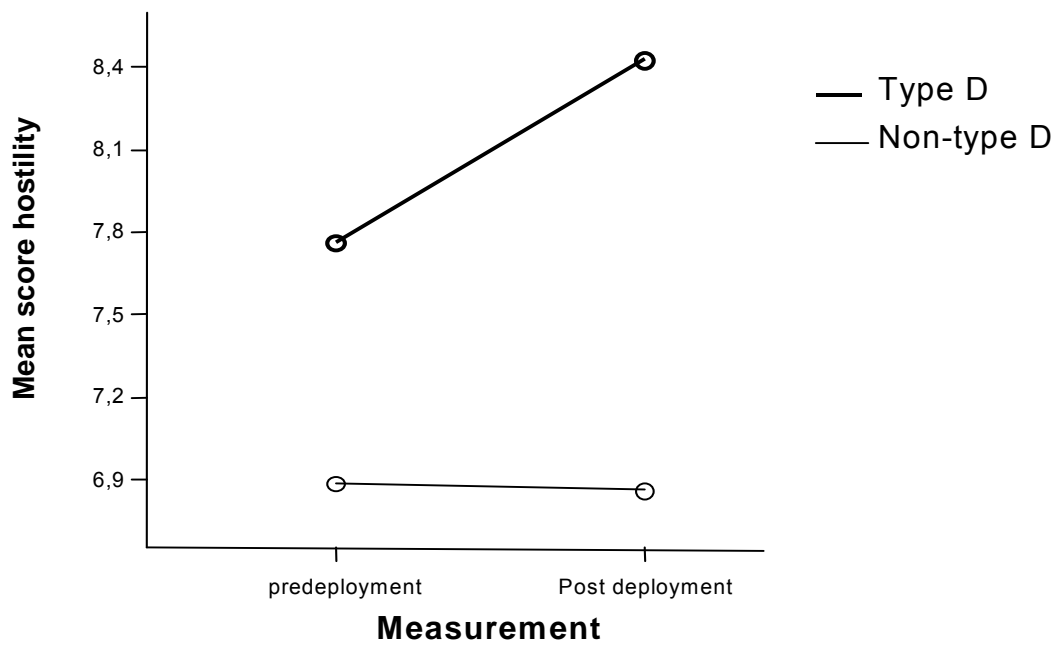
Subscale interpersonal sensitivity and paranoid ideation

Type D and interpersonal sensitivity



Subscale hostility

Type D and hostility



Subscale sleeping problems

Type D and sleeping problems

