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# **Should all Soldiers be Sensation Seekers?**

**The role of Personality in the Context of Operational Deployments**

**Merle Parmak**

*Thesis to obtain the degree of Ph.D. in Psychology and in Social & Military Sciences*

Chair: Dr. B. Gomes de Mesquita

Supervisors: Dr. M. Euwema (Katholieke Universiteit Leuven, Belgium)  
Dr. J. Mylle (Royal Military Academy, Belgium)

Opponents: Dr. N. Pattyn (Royal Military Academy, Belgium)  
Dr R. Van Gelooven (Ministry of Defence, the Netherlands),  
Dr K. De Witte (Katholieke Universiteit Leuven)

*The defense of this Doctoral Dissertation took place on June 14, 2011 at 05.00 pm in  
KU Leuven Promotiezaal, Universiteitshal, Belgium*

*The armed forces need to hold a difficult balance between the preservation of traditional military core values (ethos) on one side and the accommodation to societal changes; to the changing values of youth. They need to preserve the core military values, without which no mission could be achieved. The inculcation of core values becomes a critical tool for building up cohesion and morale, discipline, esprit de corps, etc., essential for the accomplishment of operational goals – but at the same time, satisfying the needs, expectations, goals and diversity of soldiers becomes also a key issue.*

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## **Should all Soldiers be Sensation Seekers? The role of Personality in the Context of Operational Deployments**

In this dissertation individual differences of soldiers' psychological adaptation in a military task environment are explored. To better understand the role of personality in soldiers' psychological well-being in the context of operational deployments, the dissertation takes its starting point in an interactionistic approach, the Person x Environment (P x E) theory (Lewin, 1935).

The environment in operational deployments can be characterized by elevated risks and unpredictable incidents, but also by unquestionable regulations, tightly organised life and tedious tasks and duties. Being simultaneously present, these contradictive conditions – chaos and order – constitute a challenge for soldiers' psychological adaptability. Although soldiers in general manage to adapt, there are those whose personality-based needs are less met by the reality of a particular deployment, and whose mental persistence<sup>1</sup> is more challenging to maintain. The author conducted a series of studies to explore the role of personality, more specifically the role of two narrow traits, Sensation Seeking and Need for Structure, in the psychological adaptability of Estonian soldiers deployed to the Helmand province, in Afghanistan, as part of NATO's International Security Assistance Force (ISAF).

Verifying the relevance of P x E fit theory in the context of operational deployments, author's findings contribute to a field of performance research, illustrating the need of an interactional approach studying performers' mental persistence in a challenging environment. We have demonstrated the importance of considering not only skills (trainable) and abilities (identifiable) of performing individuals, but also their personality-based needs that may interfere with the outcome of interest. Based on the conclusions of the dissertation, a targeted approach in military training and post-deployment programs is encouraged. As an example, a behavioural modelling technique

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<sup>1</sup> Defined from a motivational perspective (Bandura, 1989, 1991) in terms of one's willingness or a motivational urge to intensify his efforts and persistence of exertion in this particular environment.

and simulations are suggested to prepare military personnel for complex operations in contemporary environments. In addition, Third Location Decompression programs are introduced to help their transition from the operational environment back to “normal” life.

In Chapter 1 the author explains the theoretical ground of the research and formulates the research questions. In Chapter 2, the first empirical study is presented, in which the author demonstrates that soldiers with different personality profiles perceive and evaluate the environment and tasks in different ways. Chapter 3 describes the second empirical study, in which the author reports that soldiers are normally able to adapt their personality-based needs to the environmental demands. Chapter 4 illustrates how the soldiers’ personality profile is related to the difficulty in adapting to the realities of deployment. In Chapter 5, the general discussion, the author describes the relevance of results in terms of theoretical and practical implications.

Summary of the main findings:

- The two studied personality predispositions –sensation seeking and need for structure – influence the perceived situational structure of a task in a military environment in terms of riskiness and predictability (Ch. 2);
- Reflecting the operational reality in terms of increased levels of risks and restrictions, an adjustment in the expression of personality-based needs, namely in Sensation Seeking and in Need for Structure is observable (Ch. 3);
- Soldiers, whose personal predispositions are corresponding to the reality of deployment, namely soldiers who do like a well-ordered environment and have at least a moderate need for sensations, are the least likely to become psychologically influenced negatively by the deployment; i.e. showing the smallest decrease in well-being (Ch. 4).

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## Chapter 1<sup>2</sup>

### Ground of the Dissertation

The presence of two poles, strict regulations and thrilling incidents, in every operational environment constitutes a major challenge for military leaders. Soldiers who do well in a clear and secure environment (like the home garrison) might respond with different behaviour, well-being and performance in an unpredictable and risky surrounding (like an operational deployment). Or taking the opposite, troops who do well in combat, can be undisciplined problem-makers in their regular service in the garrison. The Person x Environment approach is taken to explore the mechanism of this phenomenon from the perspective of soldiers' psychological well-being while performing in particular task environments. The present chapter describes a theoretical framework and the relevance of the dissertation, offers the background (including the context of the Estonian Army), and formulates the main research question. Since we want to provide a complete overview of the whole dissertation in this chapter, parts of it are re-taken in the respective chapters.

*The military is composed of two fundamentally different types of individuals, each with unique advantages and weaknesses. One type can be characterised as adventuresome, innovative, imaginative, daring and decisive; the other type is describable as dependable, conscientious, detail oriented, punctual and selfless. Both types are always present in the military population to a greater or lesser degree. Times of peace favour one style; conflict favours the other (Russell, 2000).*

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<sup>2</sup> This chapter is based on Parmak, M., Mylle, J. J. C., & Euwema, M. C. (2011c).

## **1.1. Introduction**

In his classic work *On War*, written nearly two centuries ago, the Prussian general and influential military theorist Carl von Clausewitz stated that the nature of war changes with eras. Today, in the twenty-first century, we face a rapid increase and new forms of terrorism, instead of massive field battles between clearly defined armed forces, wars are more guerrilla type. Also, military become more and more involved in so called operations other than war (OOTW), in which military tasks are blurred with peace-building, policing, etc (Broesder, Vogelaar, Euwema, & Op den Buijs, 2010). Remarkable developments have occurred also in the field of military technology. For decision makers and military leaders the enthusiasm with the engineering and technological progress has left the aspects of optimizing manpower a little into the background. When decisions about budget allocations are being made, it happens more often that human and not technical elements of forces are reduced.

However, despite the rapid progress in military technology, the human element remains the weakest and the strongest link in the chain – even one soldier can defeat or can bring operational success in a critical moment. A bulk of research has been conducted within armed forces, aiming to maximise the efficiency of military operations, including many recent ‘Operations Other than War’, whether as UN Peace Keeping missions in the Balkans or NATO-led operations in Afghanistan. Research in ‘human factors’ started with the identification of individuals deemed mentally unfit for military service, with a simple assessment of their intellectual abilities using the Army Alfa and Army Beta tests during WW I (Cronin, 1998), was further developed remarkably within a clinical paradigm during WW II (Hunt & Stevenson, 1946a; 1945b), and for now has gained dimensions of perceived meaningfulness of activity (Bartone, 2005) and even military specific neuropsychology (Kennedy & Moore, 2010). Simple tests have grown to complex constructs measuring personality-related predispositions to predict better outcomes, such as cadets’ performance in military schools (Sandal et al., 1998; Lung, Lee & Shu, 2006); service members’ performance on their duties (Driskell et al., 1994; Halfhill, Nielsen, Sundstorm & Weilbaecher, 2005; Hartman, Kristensen & Martinussen,



2003); or attempts to identify person's vulnerability of mental collapse (Neria, Solomon & Dekel, 2000; Solomon & Mikulincer, 1990).

Exploring resilient responses to stressful circumstances, the concept of psychological *hardiness* is widely used in military studies appearing to be an important individual characteristic associated with stress tolerance and successful performance in highly demanding occupations (Bartone, Roland, Picano & Williams, 2008). Previous research has established hardiness as a dispositional factor in preserving and enhancing performance and health, despite stressful circumstances (Maddi, Harvey, Khoshaba, Lu, Persic & Brow, 2006), meaning a strong commitment to self, an attitude of vigorousness toward the environment, a sense of meaningfulness, and an internal locus of control (Kobasa, 1979). According to Bartone (2006) a critical aspect of the hardiness mechanism likely involves the interpretation of, or the meaning that people attach to events around them and their own place in this world of experiences. High-hardy people typically interpret experiences as interesting, challenging and something they can exert control over (Bartone, 2006). Another similar construct often mentioned in military research is *resilience* which can be defined as “the sum total of psychological processes that permit individuals to maintain or return to previous levels of well-being and functioning in response to adversity.” (Bowles & Bates, 2010, p. 382). Although not always distinguishable, psychological hardiness and resilience appear to be trainable or amplifiable. Hardiness, for instance, is possible to cultivate through leadership, in the form of leading by example, providing subordinates with a role model of the hardy approach to life, work, and reactions to stressful experiences (Bartone, 2006); and resilience can be built with the help of several organizations and centres available to promote resilience for military members, providers, units, families, and communities (Bowles & Bates, 2010).

Surprisingly, no significant emphases are put so far on Person x Environment (P x E) fit in the military research, although a continuous tradition of that approach has proven its usefulness in civil settings (Cronbach, 1957; Barrick & Mount, 1993; Beaty, Cleveland & Murphy, 2001; Lewin, 1935; Pervin 1968). The role of environment, however, is

mentioned in the concept of operational tempo (OPTEMPO) (Castro & Adler, 2005) in which the pace of military operations (workload in garrison, training and deployed environments), its consequences on soldiers performance (Thomas, Adler & Castro, 2005), turnover intention (Huffman, Dolan & Castro, 2005), soldiers' health (Dolan et al., 2005) and personal life aspects (Adams et al., 2005; Britt & Dawson, 2005) is taken into account. Still, that concept too does not emphasize explicitly the potential role of the interactional effect between environmental demands and personal predispositions on explored consequences.

Recently, the interactive complexity of human and military systems was captured in the Military Demand – Resource model (MDR) developed by Bates et al. (2010). The aim of this MDR model is (1) to use a strengths-based approach to assess what resources are available and what resources are needed based on the environmental demands, (2) understand and optimize the interactions between a person's mind-body internal resources and the complexities of the military's demands and external resources, and (3) assess the dynamic interaction between demands and resources over time. Describing internal (e.g., awareness, beliefs, coping, decision making) and external resources (aspects of and from the environment) as the resource environment important to accomplish mission goals, the MDR model can be partly interpreted as a P x E framework. However, the model does not say anything about the role of individual differences. We believe that including personality; the P x E model could provide an additional value to the already existing models for human military performance.

## **1.2. Military Task Environment in Deployments**

Due to political and technological developments, as well as to changes in the nature of military work, a new range of operational deployments (OOTW) have emerged. Stressors in nowadays military environments range from boredom and lack of meaningful work, over ambiguity and fear of potential threats, to actual threat, danger and violence (Krueger, 2008). Sometimes the situations change within very short time intervals (e.g. an unexpected camp attack or a patrol ambush), sometimes they remain the same during a whole deployment (e.g. duties in a support vs. a combat unit) (Kavanagh, 2005). In the

literature, contextual factors, such as the exposure to danger, uncertainty, rapid changes, low control, enforced passivity, and lack of information, have been recognized as important stressors (Kavanagh, 2005; Weisæth, 2003).

One of the characteristics of military operations is the contrast between at the one hand highly structured tasks, with a risk of passivity and boredom (for example standing guard at the gate of garrison barracks), and on the other hand tasks with high levels of unpredictability and threat (for example a night patrol in hostile environment). Author was inspired for this research by experiences in the field. An experienced NCO<sup>3</sup> who has been deployed several times expressed this clearly:

*“According to my experiences, camp guard is the dullest task during deployments. Everybody tries to break free of that. If you are in a camp like /... / and depending only on your own unit, you have no choice — you have to do it. We all understand that it is necessary, but this is just depressing and makes you feeling that what you are doing is senseless; besides it is not interesting at all. Although there are people in every deployment who participate just for money and try to have a quiet and secure deployment, there are still lots of people who engage for some action. They are interested in what is outside of the camp, how the nature looks like, the way locals live, etc. Of course, as a task, camp-guarding is more secure — no risk to step on an IED (improvised explosive device), however, it is boring and leaves you with the feeling of meaninglessness.”*

The presence of two extremes (safe and boring, as well as unsafe and challenging) in every operational environment constitutes a major challenge for soldiers as well as for military leaders who are supposed to get out the best from their men in all environments. Field stories and anecdotal evidences show that soldiers who do well in a clear and secure environment (like staff work in peacetime), do not necessarily maintain their persistence in an unpredictable and risky surrounding (like combat operation in wartime), or vice versa. Russell (2000) divides soldiers into clusters: on the one side there are individuals

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<sup>3</sup>NCO – non-commissioned officer

drawn to the military by potential for excitement or adventure, on the other side individuals are drawn to the security of the military system, the guaranteed employment, and social benefits. He emphasises, however, that it is not plainly to claim that some type is better than the other, it is just to say that the willingness to perform in a particular environment can be different among personality types.

It is known that the characteristics of the work environment may be responsible for positive and negative effects on performance and on well-being of the performer (Gaillard, 2008). However, environmental stressors are experienced differently depending on the resources of a given individual (Adler, Brett & Bartone, 2003; Stopol, 1954), and while experienced differently, they are most likely to elicit different coping responses. Especially in times of stress, individual differences are the source of behavioural variation, and these differences are neither fully reduced nor reducible through drill and expertise (Hancock & Szalma, 2008). It has even been argued that capturing the differentiating qualities of individuals in a variety of situational contexts is the key question of personality psychology (Ten Berge & De Raad, 2002).

Read et al. (2010) have conceptualized person–situation interactions in terms of the interaction between the motivational systems (person) and the influence of situational features (situation) on the motive systems. For each individual there are environments that match more with the characteristics of his personality and the level of overlap is expressed in his contentment and performance (De Rue & Morgeson, 2007; Greenberg, 2002; Holland 1997; Lyons & O’Brien, 2006; Pervin, 1968; Roberts & Foti, 1998; Schneider 1978). The person can be represented in terms of motivational system and situations that are represented in terms of their affordances for the person’s motives (Read et al., 2010). Research has shown that personality dispositions alone are not enough to predict the outcome; potential co-effects with the type of situation or environment should be taken into consideration (Edwards et al., 2006; Fritzsche, McIntire & Yost, 2002; Fritzsche, Powell & Hoffman, 1999; Kieffer, Schinka & Curtiss, 2004; Liesing & Igl, 2007; Mischel, 1984, 2004a, 2004b; Mischel, Shoda & Mendoza-Denton, 2002; Walschburger, 1994; Witt & Spitzmuller, 2007). “*Stress is often in the mind of*

*stressed*” and therefore it is important to include both situational and personality variables in understanding the soldiers’ response to stress (Krueger, 2008).

Bringing this line of thinking to the military context helps to understand why soldiers who are effective and perform well in one operational context may appear puzzled and useless in another context. The complexity of modern military operations, in which soldiers often have to perform under both structured and safe, and unstructured and high risk circumstances, creates a major challenge for the recruitment, selection and training of military. The problem is acknowledged in many countries. Our studies are conducted in Estonia, and therefore we describe the current situation in this country and its army.

### **1.3. Selecting and Training Service Personnel for Deployments**

The average size of the Estonian Defence Forces (EDF) in peacetime is in rounded figures 3800 persons; about 1500 of them are conscripts and 2300 are professional soldiers. The duration of the compulsory military service is 8 or 11 months, depending on the education and position provided by the EDF to the conscript. In the compulsory military service conscripts acquire basic knowledge necessary for them to act as specialists in wartime military units and are not obliged to take part in OOTW.

Estonia became a NATO Ally in 2004. In addition to the capability to protect the territory of Estonia, the Army’s development priorities (the main Service component of the EDF) are the capability to participate in missions outside the national territory in co-operation with the Allies. The Army’s operational component consists of an infantry brigade and a homeland security structure. The infantry brigade acts as a training and support frame for deployable units in an infantry battalion. The Homeland security units have the capability to carry out territorial military tasks and support civil structures.<sup>4</sup>

The criteria to be deployable to peace support operations (PSO) are general and cannot be viewed as part of a systematic approach. Mostly, the application from the person is enough to be selected. The only substantial aspect to be deployable is to have the status

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<sup>4</sup> Source: [http://www.mil.ee/index\\_eng.php](http://www.mil.ee/index_eng.php)

of an enlisted service member of EDF.<sup>5</sup> To become a service member of EDF one must be Estonian citizen, having passed the conscription<sup>6</sup>, having no criminal record and being certified as physically and psychically healthy by the medical commission of EDF. As far as one is enrolled as a service member, he/she is entitled to apply for operational deployment. Within the current research, we call this selection system *random self-selection* because self-selected personnel apply for deployment on voluntary basis and do not have to pass any standardised selection procedure.

Being recruited as a professional soldier and allocated to an infantry battalion includes the explicit obligation to be deployable to OOTW. In between deployments, professional soldiers live their everyday life in garrison and are engaged in their regular training exercises in their home-unit. Their regular training includes different levels of combat tactics, short-term courses of specific technical skills, extensive operational training, with the broad aim to keep the unit(s) constantly on a „ready for operations” level. The main emphasis is on continuous rehearsals of individual skills (using equipment, weapons, and armoured cars) and teamwork skills (at squad-, platoon-, company and battalion level).

For PSO-s, the length of stay in the mission area is six months. Approximately three months before deployment to the PSO area, the pre-deployment training for all recruited soldiers begins. Pre-deployment training is an intense period of approximately three months in which subject matters are accentuated to specific action-oriented skills. Although it is already acknowledged that deployed troops can face a restricted, boring and sometimes meaningless existence, which is part of an unexpected and stressful reality (Mæland & Burnstad, 2009), the pre-deployment training prepares the already self-selected (action-oriented) soldiers even more how to deal with threats and risks, but not for an increased level of restrictions or overwhelming boredom. Before presenting the study design, the methodological description of the research is given.

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<sup>5</sup> In Estonia, service members from other units of EDF can also apply for deployments

<sup>6</sup> Applies for male applicants only

#### **1.4. Methodological Description of the Research**

For the research, we have asked one unit of conscripts (validation of measures) and three detachments of professional soldiers deployed to the Helmand province in Afghanistan between the years 2005 and 2008, to serve as our sample (longitudinal design). Demographically, both of our samples have been homogenous; all available respondents are approximately in same age and educational background, white Estonian males.

##### *Description of Key Study Variables*

There is substantial evidence that some genetically predisposed biological characteristics (e.g. the brain organization and/or neurochemistry) may cause individual differences in psychological traits and that biological mechanisms are responsible for regulating our psychological states; i.e. motivation, emotions and cognitions (Carver & White, 1994; Eysenck, 1990; Gable, Reis, & Elliott, 2000; Gray, 1978, 1987, 1990; Kuhl, 1994; Wilson, Barrett & Gray, 1989; Zuckerman 1990, 1994, 1995, 1979, 2004; Zuckerman & Kuhlman, 2000). There are also findings demonstrating that narrow personality traits augment broad traits in predicting task performance (Loveland et al., 2005). Given the strong – even extreme – contrasts in situational demands for military personnel in different task environments; author selected for the study two narrow personality traits, namely the Need for Structure and Sensation Seeking as key personality characteristics.

Most military tasks are highly regulated, and Standard Operational Procedures have been developed for many situations, especially for a deployment environment where additional restrictions apply. Theoretically, this well-defined environment must fit with the expectations of soldiers who are high in need for structure (e.g., Parmak, Mylle & Euwema, 2011a; Thompson, Naccarato, Parker & Moskowitz 2001). On the other hand, sensation seeking is not only an element in recruiting campaigns (*‘explore the world, join the army!’*), but becomes more than important when the soldier is confronted with risks and life-threatening situations in reality. The service member should be able to respond adequately in these contexts (Neria et al., 2000) without major psychological trauma (Netter, Henning & Roed, 1994). In the military, the high risk acceptance is seen as a desirable quality of sensation seeking because it is useful in terror management under

conditions of threat while soldiers with high need for structure may become overwhelmed by the amount of risks present (Van den Berg & Soeters, 2009). When threat is effectively present, people high in need for structure are challenged also by the terror management. This drawback of being a structure seeker was confirmed in the study by Van den Berg and Soeters (2009) who found that soldiers scoring high on this trait are able to tolerate the risk of dying in non-threatening situations but lose this tolerance when situations become life-threatening. Based on literature, this side of military life must fit with the expectations of soldiers who are high in need for sensations (e.g., Parmak et al., 2011a; Zuckerman, 2005). We shortly discuss the two constructs in this chapter although they are described as study variable in following chapters as well.

*Need for Structure* The main underlying mechanisms for Need for Structure are information processing and cognitive structuring. The cluster of related cognitive preferences is described in the literature by peoples' need for simple vs. complex structures (Thompson et al., 2001), by their orientation towards certainty (Roney & Sorrentino, 1995; Shuper & Sorrentino, 2004), and by the degree of enjoying cognitive endeavours (Cacioppo & Petty, 1982; Cacioppo et al., 1996). The need for a simplified and clear world view has important social, cognitive and behavioural implications. Need for Structure is found to predispose peoples' ability to tolerate the risks and complexities in their everyday live (Meertens & Lion, 2008; Neuberg & Newsome, 1993), and explains their role perceptions, situational preferences and the extent of desired environmental regularity (Heponiemi et al., 2008; Moskowitz, 1993). People scoring high on the Personal Need for Structure scale (PNS) prefer clear and predictable situations over complicated and indefinite ones (Neuberg & Newsome, 1993). They tend to enjoy simple environments with tightly organized life and they try, at least perceptually, to keep their surroundings clear and plain (Gordon, 1997; Schaller et al., 1995). Although a high Need for Structure may be perceived as overall profitable by the military "chain of command" and in "all supplies guaranteed" environments, it might have its dark side when situations turn into complex or unpredictable and life-threatening ones (Van den Berg & Soeters, 2009) as it is the case in most operational environments.



*Sensation Seeking* Sensation Seeking is a trait which describes the tendency to seek novel, complex and intense sensations; e.g. thrilling experiences and the willingness to take risks just for the sake of such experiences (Zuckerman, 1994, 2005). Neurobiological findings show that individuals high in sensation seeking are not only strongly activated by exciting, thrilling and potentially dangerous activities but also may be less likely to inhibit or appropriately regulate that activation than other people (Joseph et al., 2009). In research, sensation seeking is mostly referred to as a negative characteristic for being related with substance abuse and sexual risk-taking (Brady & Donenberg, 2006), with enjoyment of fight and violence (Hoffner & Levine, 2005), with risk propensity (Killgore, Vo, Castro & Hoge, 2006) and with cortical under-arousal associated with psychopathy (Herperz & Sass, 2000), to name a few. This negative connotation holds also for research in military settings where sensation seeking is viewed as a predictor of antisocial predispositions/behaviours, unacceptable risk-taking and poor health outcomes (Fear et al., 2008; Glicksohn, Ben-Shalom & Lazar, 2004), leaving by doing so potential positive aspects of sensation seeking mostly out of discussion. However, Van Emmerik and Euwema (2009), studying Dutch peacekeepers, have found positive relations between adventurism (a construct closely related with sensation seeking), cultural empathy, and self-efficacy during peacekeeping, and the search for future assignments. Moreover, a study with Israeli veterans has shown that, for higher-sensation seekers, performance during the war and subsequent long-term adjustment are better than for lower-sensation seekers (Neria et al., 2000). Taking into account the nature of military operations, a person's ability and readiness to accept risks and complexity (Dretsch & Tipples, 2008; Hartmann et al., 2003) might be highly relevant for successful coping with unstructured situations.

Need for structure and sensation seeking are not to be seen as two sides of one coin or the two poles of one dimension. In the literature, the two constructs are usually discussed separately. In this thesis author postulates that sensation seeking and need for structure have to be considered as two separate, however related, dimensions, that have differential effects on a variety of measures. Surprisingly, there is hardly any empirical or theoretical literature on the relation between the two traits. A search for relevant Subject Terms in

the scientific database (EBSCO)<sup>7</sup> revealed many studies about Sensation Seeking (353 hits), less studies about Need for Structure (23 hits), and zero studies where both of these narrow traits are studied together (0 hits). One to refer to is a recent study focussing on risk taking by Meertens and Lion (2008) showing that risk-taking is negatively correlated with avoidance of uncertainty. One of the aims of the current thesis therefore is, to explore the relation between sensation seeking and need for structure and the combined effect on behavioural and emotional outcomes of deployed military.

Summing up the personality variables, two specific traits focusing on needs-based personality traits, need for sensations and need for structure, are selected as our main personality variables. For the tendency to seek structure author uses the concept of Need for Structure (Neuberg & Newsome, 1993), referring to the person's tendency to form and possess more simply structured (or stated the other way around: less complex) views of the world. Describing the tendency to seek risks, the well-known concept of Sensation Seeking (Zuckerman, 1994) is used, referring to the person's predisposition to enjoy challenging and thrilling experiences.

*Situational Structure* The concept of situational structure is referred to in different ways in the literature. Even if we leave aside the typologies of situations based on how people deal with situations (Ten Berge & De Raad, 2002) and restrict ourselves to the more contextual aspects, several classifications are used. To name a few: Marks, Zaccaro and Mathieu (2000) have stressed the novelty component by classifying situations as routine vs. novel. Beaty, Cleveland and Murphy (2001), who have based their research on normative criteria and the behaviour regulation component, called them strong vs. weak situations. Shaw and Gupta (2004) have put emphasis on the element of environmental complicacy and use the terms complex vs. simple contexts. All these criteria for distinction are roughly the same; i.e. the organisation or the structure of the environmental context. According to the stressors and context factors specific to the military (Gaillard, 2008; Weisæth, 2003), the components of predictability and level of risks involved, have to be taken into account explicitly.

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<sup>7</sup> Note: the search was conducted on 25.11.2010

In our approach, we take “situational structure” as the leading principle for a contextual distinction of military task environments as structured vs. unstructured according to their degree of predictability and of the level of risks involved. Structured situations are simple and predictable; no risks are present nor expected (e.g. routine guard duty in camp). In structured situations the environment provides clear cues for what is going to happen next and what behaviour is expected to be performed. Guidelines, routines and pre-packed solutions to problems are given. The focus is on details of activity which are to be managed in an orderly fashion and are based on skills and knowledge and no threat or physical harm are involved. Unstructured situations are complex and unpredictable; the situation evolves unexpectedly and/or can turn into harmful or risky (e.g., a patrol in mined enemy area). The environment provides considerably few benchmarks for right behaviour or references for the expected course of action or provides them on an inconsistent or infrequent basis. Solutions need flexibility and willingness to take risks when an outcome is unknown. The focus is on the process which is to be managed with confidence and efficiency. Threat or physical harm might be involved.

To summarize the working definition for situational structure we use in our studies is: the structure of the situation is a context-specific characteristic of the environment described in objective terms of clearness (predictability) and potential harms involved (riskiness).

### *Main Measures*

The Sensation Seeking Scale V (SSS-V, Zuckerman, 1978; 2005) was used for the assessment of Sensation Seeking (SS). The SSS-V is a 40-item forced choice questionnaire that measures the degree to which a person seeks out novel and adventurous experiences. The total score is obtained by adding up the scores of four subscales (each of 10 items) representing the different dimensions of SS: 1) a desire for adventures or unusual sensations, named Thrill or Adventure Seeking (TAS), 2) experiences through the mind and senses, called Experience Seeking (ES), 3) attitudes regarding social and sexual stimulation, labelled Disinhibition (DIS) and 4) intolerance to monotonous conditions, defined as Boredom Susceptibility (BS). Scoring higher on SSS-V (and on all of its subscales) indicates a higher sensation seeking tendency.

The Personal Need for Structure (PNS, Neuberg & Newsome, 1993; Thompson et al., 2001) construct is found to reflect quantitatively inter-individual differences (Meiser & Machunsky, 2008) and was used for the assessment of the Need for Structure (NS) in our research. This inventory consisted of 11 of the original 12 items (item 5 was dropped; see Neuberg & Newsom, 1993) which were evaluated on a 4-point scale ranging from *strongly disagree* to *strongly agree*. The scale is divided over two sub-scales: 1) the preference component: the extent to which people prefer to structure their lives, called Desire of Structure (DS) with 4 items; and 2) the reaction component: the manner in which people respond when confronted with unstructured unpredictable situations, named Response to Lack of Structure (RLS) with 7 items. The instrument assesses the degree to which a person prefers a simple structure, organization and clarity. Higher scores on the PNS (and its subscales) indicate a higher structure seeking tendency.

Using the described methodology, we set up the study consisting of three separate but conceptually related empirical studies.

### **1.5. Setting up the Study**

Strong perseverance usually pays off in performance accomplishments, however when faced with difficulties it is the individual who decides how much hardship he or she is willing to endure for pursuits related with particular obstacles (Bandura, 1991).

We assume that psychological well-being (as dependent variable) of deployed service personnel is related with their personality predispositions in interaction with the demands of a particular task environment (as independent variable). Schematically, the research question of the dissertation was developed based on the model presented in Figure 1.1.

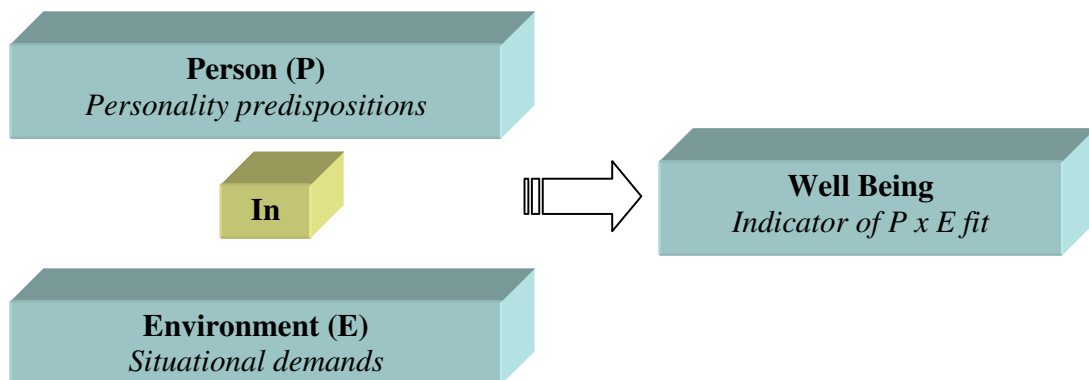


Figure 1.1 *Setting up the study: the research model*

To answer our central question, author designed and conducted three empirical researches described below and corresponding to the Chapters 2, 3 and 4 of the Dissertation.

*Research 1:* After having validated the research instruments for the Estonian military population in the first part of this research, we proceeded with studying the perception of the situation among soldiers with different personality profiles. To explore that, we used simulated field exercises as a part of soldiers' pre-deployment training. The research model for the field exercise is represented in Figure 1.2.

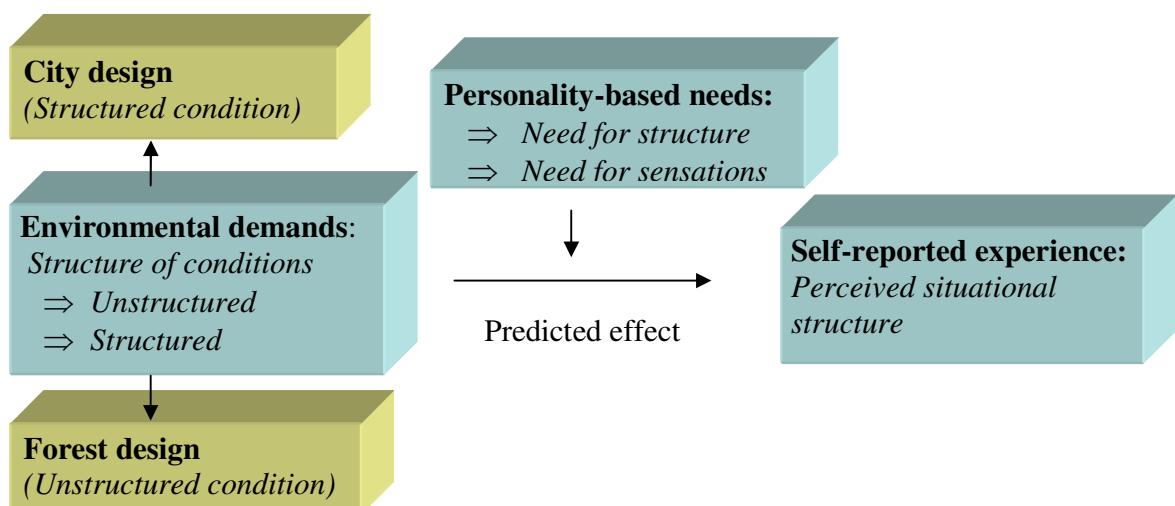


Figure 1.2 *Components, variables and design for the field setting*

The role of two personality traits, Sensation Seeking and Need for Structure, in soldiers' situational perception was investigated. Scenarios for the simulations were composed with the help of adventure games' specialists and were designed to simulate structured and unstructured situations (respectively City scenario and Forest scenario) using situational elements from real deployment environment. In this research the author confirmed that soldiers' personality propensities are significantly related with how structured the current situation is perceived.

Chapter 2 (based on Parmak, Mylle & Euwema, 2011a) describes the methodology and findings of this two-part research and discusses potential implications for selection, training and performance in the armed forces.

*Research 2:* After having explored personality related differences in perceived situational structure, the author examined if soldiers are able to adapt their characteristic personal needs to the environmental demands in their immediate surroundings. The soldiers' situational adaptation with the environment-specific demands of a military deployment – i.e. the Helmand province in Afghanistan – was under closer look. Certain changes on the level of those characteristics take place across deployment: soldiers who are lower in Sensation Seeking perceive themselves as more willing to seek for sensations after deployment (according to their self-reported level of sensation seeking), and soldiers at the extremes of the Need for Structure dimension, modify their seeking for structure after deployment towards a moderate level (according to their self-reported level of structure seeking). According to the findings, temporal characteristic adaptations in the self-reported needs with certain environmental demands can be suggested. In terms of model design, our expectations in the second study are presented in Figure 1.3.

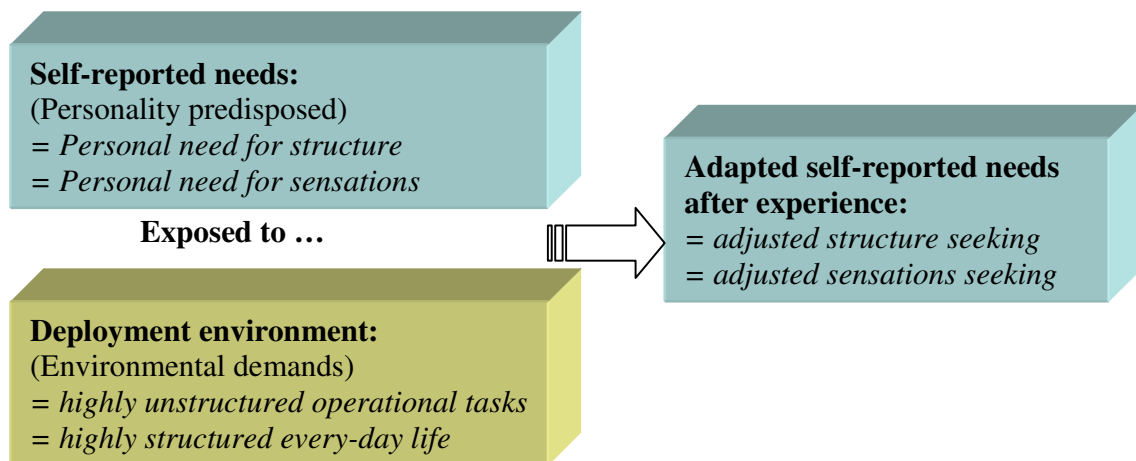


Figure 1.3 *Adaptation of self-reported needs after being exposed to particular environmental demands*

The research design and the findings are described in Chapter 3 (based on Parmak, Euwema & Mylle, 2011).

*Research 3:* The relation between Sensation Seeking and Need for Structure, and psychological well-being of Estonian soldiers was examined before and after the deployment to Helmand province in Afghanistan. We expected to find an interaction effect between personality categories (SS and NS) and Time (before and after) on well-being. In this research we were able to show that soldiers' personality is related with the changes in their well-being during deployment and verified our belief that an interaction effect between individual and situational variables on psychological well-being can be found after the deployment experience. Moreover, we confirmed that the P x E effect on a person's well-being is rather stable over time – as measured before and after deployment. The strongest decrease in well-being during deployment took place among soldiers low in need for structure, especially when this low in need for structure was combined with moderate or high need for sensation seeking.

Graphically, the simplified combination of personal and situational characteristics in this research was hypothesized to be related to psychological well-being as shown in Figure

1.4. The best comfort was expected in situations where personal need and situational characteristics match.

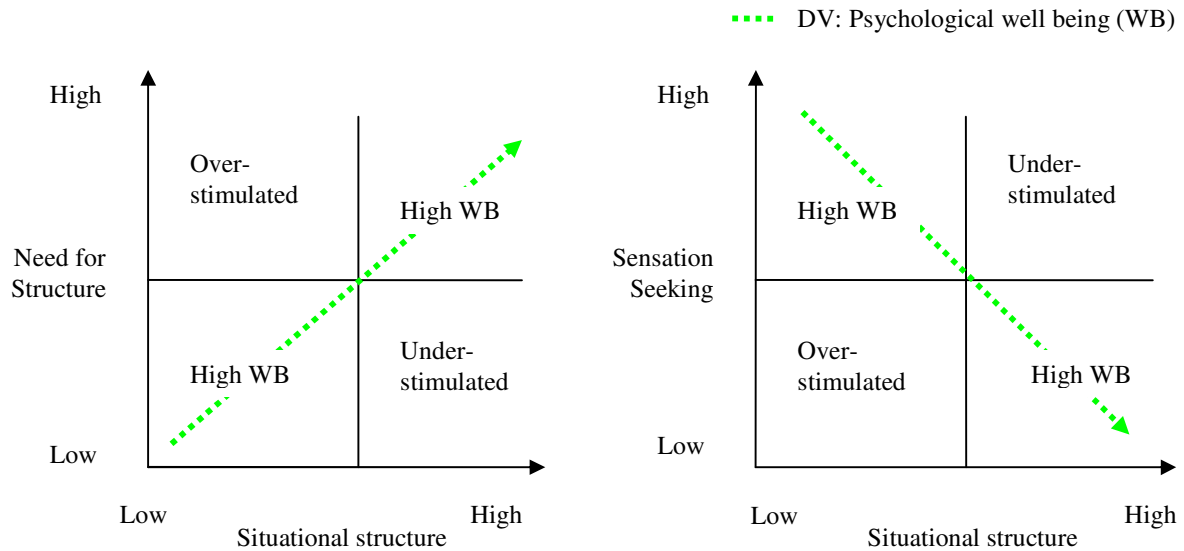


Figure 1.4 *Hypothesized relations (P x E fit) between the situational structure and psychological well-being*

The description of this research composes the body of the Chapter 4 (based on Parmak, Mylle & Euwema, 2011b).

To summarize, the dissertation is grounded on the P x E model and is looking for an answer to the question: *Are personality predispositions related with soldiers' psychological well-being in a deployment environment, and if yes – up to what extent are they adaptable according to environmental demands?* The general overview of the research questions is modelled in Figure 1.5.



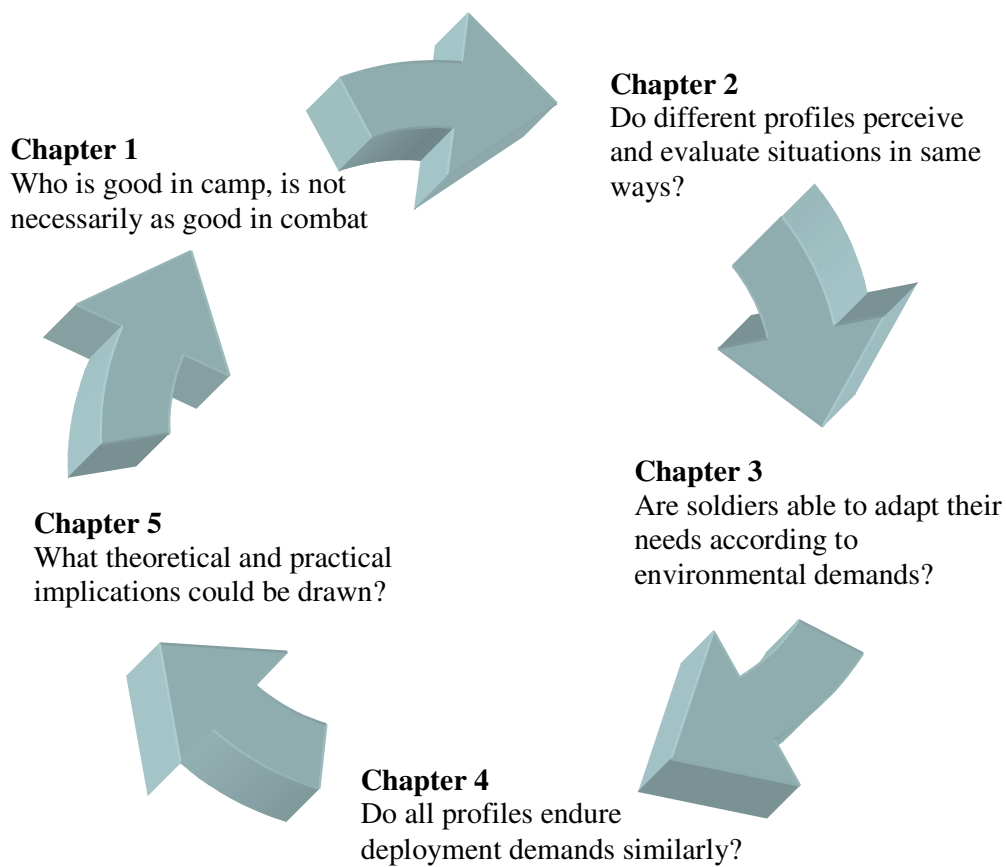


Figure 1.5 *The thesis at a glance*

Our general expectation, answering the research questions is that 1) the soldiers' personality profile is related with the perception and evaluation of field situations in different ways; 2) soldiers are generally able to adapt their needs with environmental demands; and 3) for some personality profiles the deployment is more difficult to endure than for some others.

## **Chapter 2**

### **Personality and Situational Perception<sup>8</sup>**

In this Chapter the author explores the role of two narrow personality traits, Sensation Seeking and Need for Structure, in soldiers' situational perception in a military task-environment. In the first study the psychometric qualities of the personality inventories, Sensation Seeking Scale-V (SSS-V) and Personal Need for Structure (PNS), are assessed in an Estonian military sample. In the second study was explored how these traits are related to soldiers' perception of complexity (predictability) and potential harms involved (riskiness) (defined as situation structure) in two field exercise tasks. It was found that both of the explored personality traits are significantly and inversely related with soldiers' perception of situation structure in a military environment. Implications for personnel selection, training and performance of military organisations are discussed.

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<sup>8</sup> This chapter is based on Parmak, M., Mylle, J. J. C., & Euwema, M. C. (2011a).

## **2.1. Introduction**

During the last decades, the context of military work has changed dramatically. This is due to political and technological developments, as well as to changes in the nature of military work, where a new range of “operations other than war” (OOTW) (e.g. peace keeping, peace enforcement) have emerged. In the literature, different contextual factors have been recognized as important stressors, such as exposure to danger, uncertainty, rapid changes, low control, enforced passivity, and lack of information (Kavanagh, 2005; Weisæth, 2003). Stressors in current military operational environments range from boredom, lack of meaningful work, ambiguity, and fear of potential threats, to actual threats, danger and violence (Krueger, 2008). One of the characteristics of modern military operations is the contrast between highly structured tasks, characterised by passivity and boredom (for example standing guard at the gate of the compound), and loosely structured tasks with high levels of unpredictability and threat (for example a night patrol in a hostile environment). The simultaneous presence of these two extremes in the operational environment constitutes a major challenge for military leaders. In fact one might ask why, and anecdotal evidence supports this, soldiers who do well in a clear and secure environment (like staff work in peacetime) often do not maintain their eagerness and perform less successfully in an unpredictable and risky surrounding (like combat operation in wartime), and vice versa.

Characteristics of the work environment may be responsible for both positive and negative effects on performance and well being (Gaillard, 2008). However, environmental stressors are experienced differently depending on the resources of a given individual (Adler, Brett & Bartone, 2003), and stress tolerance varies depending on the type of stressful conditions (Stopol, 1954). Individual differences are the source of behavioural variation in times of stress, and these differences are neither fully reduced nor reducible through drill and expertise (Hancock & Szalma, 2008). The perception of oneself and situations differs largely, due to individual and personality differences (Arpan & Peterson, 2008; Dorros, Hanzan & Segrin, 2008; Frühholz, Prinz & Herrmann, 2010; Guidry & Hammer, 2008; Rosenkrantz & Morrison, 1992). “Stress is often in the mind of

stressed” and therefore it is important to include both situational and personality variables in understanding the soldiers’ response to potential stressors (Krueger, 2008).

The perceived fit between person (P) and environment (E) is found to be related to job satisfaction (Lyons & O’Brien, 2006) and to work performance (Kieffer, Schinka & Curtiss, 2004). This (P, E) perspective offers a theoretical basis to further explore the relationship between personality and situational characteristics in the military. More specific, we hypothesize that personality influences the perception of the work environment in such a way, that for some soldiers the environment is a positive challenge, and for others a stressor. Bilgiç and Sümer (2009) demonstrated that different aspects of military performance are best predicted by context-related personality dimensions. Considering the situational contrasts in operational context (highly/ loosely structured and risky/ routine tasks), we focus on the fit between the two relevant personality dimensions (Sensation Seeking and Need for Structure) and the perceived qualities of the task environment.

The aim of the current study is to gain a better understanding of the role of personality in soldiers’ perception of predictability and riskiness of the situation (defined as Situation Structure) while performing tasks in a military environment. According to our working definition, the Situation Structure is a context-specific characteristic of the environment described in subjective terms of perceived complexity (predictability) and potential harms involved (riskiness). For the first time, the relation between personality and perception will be tested in an Estonian military sample. The study has two goals. The first goal is to confirm the reliability and validity of the Estonian version of the personality inventories that measure Sensation Seeking and Need for Structure in an Estonian Defence Forces population. The second goal is to determine whether the personality traits of Sensation Seeking and Need for Structure lead to a particular perception of situation structures. Specifically, we explore how these two personality constructs are related to soldiers’ perception of predictability and riskiness in the situation through field simulations. We will first discuss the concept of situation structure, and then the two personality constructs of Need for Structure, and Sensation Seeking.

### *Situational Structure*

In the literature, the concept of situational structure is referred to in different ways. However, they have a common denominator for distinction; i.e., the organisation or structure of the environmental context. For example, Marks, Zaccaro and Mathieu (2000) have stressed the novelty component by classifying situations as routine vs. novel. Beaty, Cleveland and Murphy (2001), who have based their research on normative criteria and the behaviour regulation component, differentiated strong vs. weak situations, which are defined by cues (or lack thereof) from the environment concerning expected performance behaviour. Shaw and Gupta (2004) have put emphasis on the element of environmental complexity and use the terms complex vs. simple contexts.

Related to the nature of stressors and context factors specific to the military (Gaillard, 2008; Weisæth, 2003), the components of situations' "predictability" and "level of risks involved" have to be taken into account explicitly. In our approach, we put situation structure forward as the leading principle for a contextual distinction of military environments as structured vs. unstructured according to those characteristics i.e., degree of predictability and of the risks involved. Structured situations (e.g. routine guard duty in camp) are simple and predictable with no risks present or expected. Unstructured situations are complex and unpredictable. These situations (e.g. a patrol in an enemy area) can evolve unexpectedly and may become harmful or risky.

### *Sensation Seeking and Need for Structure*

In the personality literature, two specific narrow traits focus on individual sensitivity to the structure of situations, namely the tolerance of risks and situational complexity. For situational complexity tolerance this is the concept of Need for Structure (Neuberg & Newsome, 1993), referring to the person's tendency to form and possess a more simply structured (or stated the other way around: less complex) view of the world. Thus, a higher need for structure corresponds to lower tolerance for complexity. The second concept, focussing on risk tolerance is the well known concept of Sensation Seeking (Zuckerman, 1994), referring to the person's predisposition to enjoy challenging and

thrilling experiences. Thus, a higher need for sensation corresponds to higher risk tolerance.

The main underlying mechanisms for Need for Structure are information processing and cognitive structuring. The cluster of related cognitive preferences is described in the literature by peoples' need for simple vs. complex structures (Thompson, Naccarato, Parker & Moskowitz, 2001), by their orientation toward certainty (Roney & Sorrentino, 1995; Shuper & Sorrentino, 2004), and by the degree of enjoying cognitive endeavours (Cacioppo & Petty, 1982; Cacioppo, Petty, Feinstein & Jarvis, 1996). The need for a simplified and clear world view has important social-, cognitive- and behavioural implications. Need for Structure is also found to predispose peoples' ability to tolerate risks and complexities in their everyday live (Meertens & Lion, 2008; Neuberg & Newsome, 1993), and explains their role perceptions, situational preferences and the extent of desired environmental regularity (Heponiemi et al., 2008; Moskowitz, 1993). People scoring high on Need for Structure prefer clear and predictable situations over complicated and indefinite ones (Neuberg & Newsome, 1993). They tend to enjoy simple environments with a tightly organized life and they try, at least perceptually, to keep their surroundings clear and plain (Gordon, 1997; Schaller, Boyd, Yohannes & O'Brien, 1995). In hierarchically organised environments (thus with a clear "chain of command") like military (and paramilitary) organisations, a high Need for Structure may be perceived as an overall desirable trait of well-disciplined subordinates. However, when situations turn to be complex or unpredictable and risky as it is the case in most operational environments, a high Need for Structure may lead to feelings of loss of control.

Sensation Seeking is a trait which describes the tendency to seek novel, complex and intense sensations (e.g. thrilling experiences) and the willingness to take risks just for the sake of such experiences (Zuckerman, 1994, 2005). Neurobiological findings show that individuals high in sensation seeking are not only strongly activated by exciting, thrilling and potentially dangerous activities but also may be less likely to inhibit or appropriately regulate that activation than other people (Joseph et al., 2009). In research reports, sensation seeking is mostly referred to as a negative and problematic characteristic. It is

found to be related with substance abuse and sexual risk-taking (Brady & Donenberg, 2006), with enjoyment of fright and violence (Hoffner & Levine, 2005), with risk propensity (Killgore, Vo, Castro & Hoge, 2006) and with cortical under-arousal associated with psychopathy (Herperz & Sass, 2000), to name a few. This negative connotation also holds for research in military settings where sensation seeking is viewed as a predictor of antisocial predispositions/behaviours, unacceptable risk-taking and poor health outcomes (Fear et al., 2008; Glicksohn, Ben-Shalom & Lazar, 2004). However, Van Emmerik and Euwema (2009), studying Dutch peacekeepers, have found positive relations between adventurism (a construct closely related with sensation seeking), cultural empathy, and self-efficacy during peacekeeping, and the search for future operational assignments. Moreover, a study with Israeli veterans has shown that the performance of higher-sensation seekers during the war and their subsequent long-term adjustment are better than for lower-sensation seekers (Neria, Solomon, Ginzburg & Dekel, 2000). Taking into account the nature of military operations, a person's ability and readiness to accept risks and complexity (qualities related to Sensation Seeking) might be highly relevant for successful coping with unstructured situations (Dretsch & Tipples, 2008; Hartmann et al., 2003).

## **2.2. Study I**

In Study I, the psychometric qualities of the Estonian versions of the Sensation Seeking Scale-V (SSS-V, Zuckerman, 1978; 2005) and the Personal Need for Structure (PNS, Thompson et al., 2001; Neuberg & Newsome, 1993), (for details: see Measures section) were assessed in the Estonian Defence Forces. First, the questionnaires to assess these traits, SSS-V and PNS, were translated following a classic ABAB design: from English to Estonian and translated back to English by English philologists. Both versions of each test (i.e., the original one and its translation) were compared by two native speakers independently. Their feedback was taken into account and the exact wording of the items was based on the consensus of three psychologists working for the military.

As an external criterion to check the construct validity, we use the Behavioural Inhibitory/ Approach System (BIS/BAS) (Carver & White, 1994; Gable, Reis, & Elliott,

2000; Gray, 1990; Wilson, Barrett & Gray, 1989). The BIS/BAS concept is related with the sensitivity of two neurological systems (approach to reward and avoidance of punishment, respectively) in the subject's response to environmental clues (Carver & White, 1994). A major advantage of the use of this model is the considerable evidence supporting a two independent neurobiological mechanisms for these systems (Gable, et al., 2000).

In line with the abovementioned literature, we expect, as part of our validation study that SS and NS correlate negatively with each other (H1). This hypothesis is based on findings related to SS by Zuckerman (1994) and to NS by Neuberg and Newsome (1993). We further expect that in line with Zuckerman (1994), Sensation Seeking is correlated negatively with the avoidance behaviour dimension (H2a) and positively with the approaching behaviour dimension (H2b). Based on the construct descriptions of the Need for Structure (Neuberg & Newsome, 1993) and on the subject's response to environmental clues according to their behavioural inhibition and activation, described by Carver and White (1994), we expect positive correlations between NS and the avoidance behaviour dimension (H3a) and negative correlations with the approach dimension (H3b).

### *2.2.1 Methodology (Study I)*

The sample for Study I consisted of Estonian males<sup>9</sup> ( $n = 291$ ) recruited for an 11-month compulsory military service in the Estonian infantry battalion. Age of participants ranged from 18 to 24 years ( $M = 20.7$ ,  $SD = 1.1$ ). Main data for the conscripts were collected during the first week of the conscripts' service by means of the questionnaires described below. Re-testing data were collected after three months of regular training; however, only 87 conscripts were available for the second testing. Due to service related reasons (being away for training elsewhere) or to health related issues (being in hospital or dismissed from service) nearly 70% of conscripts were not available at the day of the second testing. Data of reasons for being absent were not available for examination.

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<sup>9</sup> Only male Estonians are eligible for compulsory service.



*Measures* The Sensation Seeking Scale V (SSS-V, Zuckerman, 1978, 1994; 2005) was used for the assessment of Sensation Seeking (SS). The SSS-V is a 40-item forced choice questionnaire that measures the degree to which a person seeks out novel and adventurous experiences. The total score is obtained by adding up the scores of four subscales (each of 10 items) representing the different dimensions of SS: 1) a desire for adventures or unusual sensations, named Thrill or Adventure Seeking (TAS), 2) experiences through the mind and senses, called Experience Seeking (ES), 3) attitudes regarding social and sexual stimulation, labelled Disinhibition (DIS) and 4) intolerance to monotonous conditions, defined as Boredom Susceptibility (BS). Scoring higher on SSS-V (and on all of its subscales) indicates a higher sensation seeking tendency.

The Personal Need for Structure (PNS, Thompson et al., 2001; Neuberg & Newsome, 1993) construct is found to reflect quantitatively inter-individual differences (Meiser & Machunsky, 2008) and was used for the assessment of the Need for Structure (NS) in our research. The instrument assesses the degree to which a person prefers a simple structure, organization and clarity. This inventory consisted of 11 of the original 12 items (item 5 was dropped; see Neuberg & Newsom, 1993) which were evaluated on a 4-point scale ranging from *strongly disagree* to *strongly agree*. The scale is divided over two subscales: 1) the preference component: the extent to which people prefer to structure their lives, called Desire of Structure (DS) with 4 items; and 2) the reaction component: the manner in which people respond when confronted with unstructured, unpredictable situations, named Response to Lack of Structure (RLS) with 7 items. Higher scores on the PNS (and its subscales) indicate a higher structure seeking tendency.

The BIS/BAS is a 31-item inventory to assess Behavioural Inhibition (BIS) and Behavioural Activation (BAS) (Carver & White, 1994; Gable et al., 2000; Wilson et al., 1989) evaluated on a 4-point scale. BIS (11 items) refers to anxiety proneness and to sensibility to potentially negative outcomes, while BAS (14 items) refers to willingness to engage in goal-directed efforts and to experience positive affect in potentially rewarding events.

### *2.2.2 Results and Discussion (Study I)*

Internal consistency and test-retest reliability coefficients for the SSS-V and the PNS obtained in the Estonian sample are presented in Table 2.1. These results show at least acceptable reliabilities (measured with Cronbach's  $\alpha$ ) for both total scales (SSS-V,  $\alpha = .77$  and PNS,  $\alpha = .64$ ) and from  $.51$  to  $.70$  for the respective sub-scales. Reliability was assessed through test-retest. Pearson correlations show statistically significant ( $p < .001$ ) results for all explored scales and subscales (see Table 1). The proportion of variance accounted for (PVAF) ranges from  $r^2 = .22$  to  $r^2 = .50$ , which can be considered as a large size effect (Cohen, 1988).

The reliability (Cronbach's  $\alpha$ ) for the BIS/BAS ( $\alpha = .68$ ) and its subscales BIS ( $\alpha = .41$ ) and BAS ( $\alpha = .75$ ) in conscripts' sample was acceptable although modest for BIS. Responding to BIS-items (e.g. "I worry about making mistakes" or "I feel worried when I think I have done poorly at something") can be blurred, considering that military (punishment-driven) environment is rather unusual experience for freshly recruited conscripts.

Table 2.1

*Cronbach Alphas and test-retest correlations in Estonian and original samples*

Measures	Conscripts' sample ( $\alpha$ ) ( $n = 291$ )	Original sample ( $\alpha$ ) ( $n = 254$ )	Conscripts' Test-retest (Pearson $r$ ) ( $p < .001$ )	Original Test-retest (Pearson $r$ ) ( $p < .01$ )
<b>Sensation Seeking (SSS-V)</b>	<b>.77</b>	<b>.83</b>	<b>.67</b>	<b>.94</b>
Thrill and Adventure Seeking (TAS)	.63	.81	.71	.94
Experience Seeking (ES)	.54	.65	.69	.89
Disinhibition (DIS)	.65	.78	.57	.91
Boredom Susceptibility (BS)	.51	.65	.52	.70
<b>Need for Structure (PNS)</b>	<b>.64</b>	<b>.79</b>	<b>.47</b>	<b>.76</b>
Desire for Structure (DS)	.68	.72	-	.84
Response to Lack of Structure (RLS)	.70	.70	-	.79

*Note.* Re-testing sample for conscripts ( $n=87$ ), data for PNS subscales in Conscripts' re-tested sample were not available; in the original development of the SSS-V (Zuckerman, 1978) the sample was re-tested after 3 weeks ( $n = 65$ ); and for PNS (Neuberg & Newsom, 1993), the sample was re-tested after 12 weeks ( $n = 79$ ).

To test the concurrent validity of the used instruments, Pearson correlations were calculated between the different measures. These are presented in Table 2.2. In line with expectations (H1), Sensation Seeking and Need for Structure were negatively related in our sample ( $r = -.45$ ,  $p < .001$ ). The correlations of SS and NS among conscripts respectively with BIS/BAS were as expected (H2-H3). Sensation Seeking was negatively correlated with BIS ( $r = -.16$ ,  $p < .01$ ; H2a confirmed), and positively correlated with BAS ( $r = .22$ ,  $p < .001$ ; H2b confirmed). Need for Structure correlated positively with BIS ( $r = .32$ ,  $p < .001$ ; H3a confirmed) and negatively with BAS ( $r = -.15$ ,  $p < .05$ ; H4b confirmed).

Table 2.2

*Pearson correlations of SSS-V and PNS, and for the background inventory (BIS/BAS) in tested sample (n=291)*

	<b>Sensation Seeking</b>		<b>Need for Structure</b>	
	Predicted	Result	Predicted	Result
NS (H1)	$r < 0$	-.45***	-	-
BIS (H2a)	$r < 0$	-.16**	$r > 0$ (H3a)	.32***
BAS (H2b)	$r > 0$	.22***	$r < 0$ (H3b)	-.15*

*Note.* NS = Need for Structure; SS = Sensation Seeking; BIS = behavioural inhibition, BAS = behavioural activation.

\* $p < .05$ , \*\*  $p < .01$ ,  $p < .001$

Study I showed that the reliability of the (sub-) scales ( $\alpha$ 's between .51 and .77) is at least acceptable for all but two. The lowest internal consistencies in this sample were found for the Experience Seeking sub-scale ( $\alpha = .54$ ) describing a looking for experiences through the mind and senses, and the Boredom Susceptibility sub-scales ( $\alpha = .51$ ), representing intolerance to monotonous activities and conditions. These sub-scales were the least reliable SS sub-scales also in the original research (Zuckerman, 1978); being .65 for both ES and BS. Unlike for BS where the test-retest reliability remains questionable ( $r = .52$ ), the test-retest reliability for ES is adequate ( $r = .69$ ).

The results of Study I showed furthermore that translated forms of the SSS-V and PNS questionnaires are significantly correlated (mostly  $p < .001$ ) with the dimensions of BIS/BAS in the expected direction as shown in Table 1 proving sufficient concurrent validity in the military sample.

Although there are some studies exploring those constructs in a military environment (e.g. Van den Berg & Soeters, 2009), to our knowledge there is no research done in the military using the SSS-V and the PNS as study instruments. Based on our study, we consider the reliability and validity of the Estonian versions of SSS-V and PNS

satisfactory for further use in the Estonian military population. Also, this study is the first to use both SSS-V and PNS in an Estonian working population, and offers therefore insights in the potential usefulness of these measures in wider society providing an argument for the further research of these measures.

### **2.3. Study II**

The aim of Study II is to determine whether Sensation Seeking and Need for Structure lead soldiers to a particular perception of situation structure (in terms of predictability and riskiness). As mentioned earlier, we consider situations to be structured when they are predictable (i.e., provide clear cues for what is going to follow) and no threat or physical harm is expected (i.e., low risk). The focus of the perceiver is on the details of the activities which need to be managed in an orderly fashion. We defined situations as unstructured when they are unpredictable (i.e., provide no references for the expected course of action) and threat or physical harm might be expected (i.e., high risk). The focus of the perceiver is on the processes in which successful solutions require flexibility and willingness to take risks. Participants were involved in a field exercise, involving simulations of two realistic scenarios they might encounter during their future deployment in peacekeeping operations.

We hypothesise that high-sensation seekers perceive unstructured situations more predictable and less risky than low-sensation seekers do (H1) while people high in need for structure perceive unstructured situations less predictable and more risky as compared to people low in need for structure (H2).

#### *2.3.1 Methodology (Study II)*

Study II was conducted with professional soldiers whose personality data (Sensation Seeking and Need for Structure) were gathered as part of a regular procedure at the beginning of the pre-deployment training course (i.e. two months before departure to Afghanistan) from all deployed soldiers. The typical preparation covers a period of three months training, in which the units are composed, and different types of drills are exercised. Our simulations were conducted during pre-deployment training, three weeks

before departure to Afghanistan. The study sample for the field simulations consisted of 30 Estonian males, the age of our participants in this sample ranged from 18 to 40 years ( $M = 22.9$ ,  $SD = 4.1$ ). To control for potential confounding variables relevant for the population of Estonian professional soldiers (i.e., prior deployment experiences, years in service, educational background), the selection of participants in the target group was done randomly from the unit to be deployed. Furthermore, leaders were excluded from participation because leadership competencies and role perception might also act as confounding variables. The field simulations were based on soldiers' pre-deployment training exercises and thus no informed consent was required. Soldiers were informed that they are participating in a study with the right to decline their participation.

Participants' personality data were extracted from the data set collected at the beginning of the pre-deployment training course. To explore soldiers' reflections in "real-time", we decided to use field simulation exercises to manipulate the structural qualities (complexity and riskiness) of the environment (Klabbers, 2006; Mautner-Markhof, 1989). Two field simulation exercises were run which were based on a structured and an unstructured scenario respectively. Our rationale was to test if engaged soldiers differ in their perception of the situation structure based on their personality predispositions SS and NS. The scenario of each of the field simulation exercises was composed with the help of adventure games' specialists. All subjects participated in the field exercise in small, leaderless groups of 10 persons in the two simulations described below consecutively on the same day.

*Measures* In Study II, we used the same measures (SSS-V and PNS) as in Study I to assess the participants' Sensation Seeking and Need for Structure. After the simulation games, all participants were asked to respond to 3 items about the perceived structure of each of the two situations/scenarios (which gives us  $2 \times 3 = 6$  data points). Each of the 3 items was measured by a Likert scale on which participants expressed their opinion by marking a number which ranged from 1 (*very much so*) to 4 (*absolutely not*).

Items to explore the perceived situation structure were based on the components of complexity (predictability and the amount of instructions provided) and of potential harms involved (riskiness) derived from the literature related to this phenomenon described above. The three same items about the perceived situation structure were used for each of the simulations. One item reflected the potential harms involved (“*The situation (if real) was risky and could be dangerous to my life*”) and two reflected the perceived complexity (“*It was not possible to predict what is going to happen next*”, and “*There were no instructions how to behave, it had to be decided on the spot*”). The scores of the three items were summed to obtain an index of the level of perceived situation structure in the two different games.

*Scenario 1: City (structured situation).* The task of the participants was to find certain information at described locations in the neighbouring city (e.g. a particular grave at the city grave yard; the price of a given beer in a local store). The route to destination was specified and the response format was prepared in which soldiers only had to fill in the gaps with the needed information. All participants were informed of the full exercise composition; clear and simple tasks were given before the simulation started, and the activities took place in a secure environment.

*Scenario 2: Forest (unstructured situation).* The task of the participants was to find a particular spot and to solve a “problem” which was not described or specified in instructions. To complicate the task, the activity took place in a wide forest area. Participants knew that they could expect some incidents but no guidelines were given how to deal with those incidents. The “problem” was a seriously wounded person to whom they had to administer the first aid and for whom they had to arrange his evacuation using only manpower and their own equipment. During the evacuation, an extra incident was created: they “lost” unexpectedly two members from their group due to a “physical injury”.

### 2.3.2 Results and Discussion (Study II)

Sensation Seeking and Need for Structure correlated negatively ( $r = -.56, p < .001$ ), as well as the indexes of the level of perceived situation structure of the two different games ( $r = -.26, n.s.$ ). Table 2.3 presents the correlations between personality variables (SS, NS) and the perceived structure of the simulation scenarios.

Table 2.3

*Pearson correlations for the variables used in simulation scenarios [hypothesis tested between brackets]*

	Situation Structure	
	Forest <i>M</i> = 5.7, <i>SD</i> = 1.4	City <i>M</i> = 9.7, <i>SD</i> = 1.7
Sensation Seeking	.39*(H1)	.19
Need for Structure	-.40*(H2)	.17

*Note.* A higher score in structure means that the situation was perceived as more structured (well predicable and not risky).

\*  $p < .05$

To illustrate how the perceived situation structure is related to SS and NS as personality predispositions we coded all participants according to the frequency tables of their scores into two (low-high) groups in both narrow personality traits: low need for sensations ( $M = 16.9, SD = 3.7; n = 13$ ) versus high need for sensations ( $M = 24.0, SD = 3.5; n = 17$ ), and low need for structure ( $M = 28.0, SD = 3.7; n = 15$ ) versus high need for structure ( $M = 37.1, SD = 2.2; n = 15$ ). Figure 1 presents the perceived situation structure for the Forest and City scenarios among the low and high SS groups (Figure 2.1a) and the low and high NS groups (Figure 2.1b).



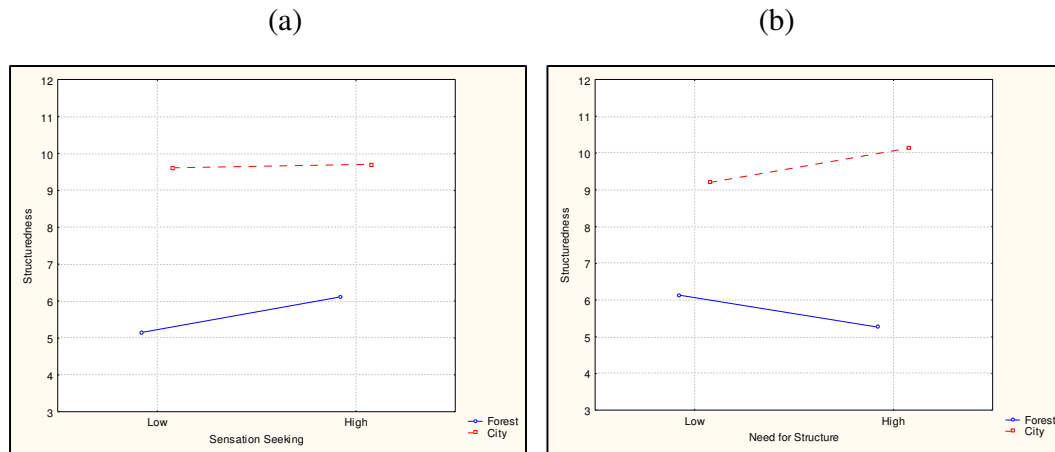


Figure 2.1 Dynamics of perceived structure of Forest and City scenarios among low and high NS (a) and SS (b) groups

According to our hypothesis H1, people who scored higher on Sensation Seeking perceived the Forest scenario (conceived to be unstructured) as more predictable and less risky ( $M = 6.1, SD = 1.3$ ) than people who scored lower on this trait ( $r = .39, p < .05$ ) ( $M = 5.2, SD = 1.5$ ). The difference between the two groups was statistically significant, ( $t(28) = 1.89, p < .05$ , one-sided). In accordance with hypothesis H2, people who scored higher in Need for Structure perceived the Forest scenario more as risky and unpredictable ( $M = 5.3, SD = 1.4$ ) than people who scored lower on NS ( $r = -.40, p < .05$ ) ( $M = 6.1, SD = 1.4$ ). The difference between these two groups was also statistically significant, ( $t(28) = 1.70, p < .05$ , one-sided).

Treating perceived situation structure of both scenarios as independent variables indicate that soldiers perceived the structure of the City scenario ( $M = 9.7, SD = 1.7$ ) significantly higher than the structure of Forest scenario ( $M = 5.7, SD = 1.4$ ), ( $t(58) = -9.93, p < .001$ ). The perceived level of structure in the City scenario was in positive direction but did not correlate significantly with SS ( $r = .19, ns.$ ) nor NS ( $r = .17, ns.$ ). Groups did not differ neither in their perception of the structure of the City scenario. Reminding the conceptualization of situation structure (predictability and riskiness) these result was are not surprising as risks and unexpected events were not present in City scenario.

Taking the results of Study II together, we can conclude that, despite a small number of participants, significant relations were found between soldiers' personality dimensions and their perception of situation structure, characterized by predictability and riskiness of the situation. Being aware of the limitations of this study, two important suggestions could be drawn from these results: 1) situational structure qualities (predictability and riskiness) are apprehensible by the person involved in this situation; and 2) personality characteristics—whether in terms of narrow traits or broad dimensions are involved in the process of perception of the structure of the situation.

#### **2.4. Conclusions**

Our research focused on constructs and concepts related to two personality traits, Sensation Seeking and Need for Structure, in the Estonian military population. The aim of the present study was twofold: 1) to assess the reliability and the validity as essential psychometric qualities of the Estonian version of the personality instruments SSS-V and PNS in this specific military sample and 2) to explore empirically the validity of these constructs based on the soldiers' perception of the situation structure through two field simulations.

This study offers some exciting new insights. The study is the first to relate personality and perception of situation structure in Baltic States. There is no psychological study reported so far on that topic neither in Latvia nor in Lithuania. Exploring the perception of situation structure our study contributes to the understanding of the relations between person and his environment, more specific in the military, in this region. Our study also demonstrates the importance and relevance of two so called 'narrow personality constructs' for occupational psychology, more specifically, Sensation Seeking and Need for Structure. The study shows that these personality constructs are meaningfully related, but also differentiated from each other. These outcomes have both theoretical and practical implications.

A first theoretical implication of our current research is related with the importance of the explored traits in military environments. Soldiers higher in Sensation Seeking seem to

perceive unpredictable and chaotic situations as more manageable (more structured) than soldiers who score low on that trait. The opposite holds for soldiers higher in Need for Structure who perceive unpredictable and chaotic situations as less manageable (less structured) than soldiers who score low on that trait. Previous studies have shown that Conscientiousness (a domain from a well-explored personality concept typically referred to as Big Five, see for example Goldberg, 1992) is negatively related with Sensation Seeking (Zuckerman, 1994) and positively with Need for Structure (Neuberg & Newsom, 1993). Based on our results, a high Conscientiousness may affect disadvantageously soldiers' perception in an unpredictable and risky context. As military are often confronted with unstructured tasks, and unpredictable and risky situations, further studies should be applied to explore if Conscientiousness (which is normally a good predictor of job performance as well as of deviant behaviours (Salgado, 1998, 2002) is necessarily the best dimension to use among military (and paramilitary) personnel. When expecting perfect performance in highly unstructured task-environments, two narrow traits (Sensation Seeking, as potentially enhancing and Need for Structure as potentially impairing) may appear as useful to consider.

Instead of focusing on the predictors of failure, we should rather explore context related personality traits in adapting personnel allocation to the challenging military world in a positive way (Matthews, 2008). It may well be that the often negatively evaluated Sensation Seeking and the undervalued Need for Structure help us to explain the differences between the stress level of staff personnel (mainly self-selected for deskwork) versus soldiers in the field (mainly self-selected for combat activity) in diverse situations. Driskell, Salas, Johnston and Wollert (2008) have made a distinction between (professional) training and stress training according to contextual factors in performance environment. They emphasise that stress training by its design and content must be event-based (thus context-specific), and analysed according to the relevance of specific tasks to be trained with the types of stress in the task environment. A deeper understanding of the interactional phenomenon between P and E in the military operational context provides a solid base for effective training designs to guarantee the best use of deployed military personnel.

Two practical implications can be concluded from this research for the Armed Forces and, potentially, for paramilitary organisations too (e.g., police, rescue teams). The first implication is related with the usability of instruments in military (and paramilitary) research. Although the concept of Sensation Seeking is explored in Armed Forces, according to the authors' knowledge, it has not been done yet with a positive connotation or by using the SSS-V questionnaire. Considering organisations valuing discipline and hierarchy but expected to perform in unstructured environments, the concept of Need for Structure is idly and undervalued. Both instruments - SSS-W and PNS - show sufficient psychometric qualities in our study and can thus be used for further research. The second valuable implication is derived from the potential impact of personality related differences on the perception of situation structure in a military environment as is suggested by our research. Our findings are well in line with what Gifford (2006) has stated; namely that individual differences play a role if the consequences of serving in war are psychologically positive or negative for the given individuals as well as how stressful they have found potentially traumatic experiences.

Finally, it is known that an individual outcome in a given situation is not predictable solely by personality characteristics or purely by situational peculiarities. Results of this research assert that operational performance nowadays has to be explored using the P-E fit model where situation related variables are explored together with individual characteristics; in experimental methodological terms, one should not look at the main effects but at the interaction effect. To follow the classic formula  $Behaviour = f(Person, Situation)$ , as brought to bear by Lewin (1935), further research in diverse environments, exploring employees coping and performance should take predictability and riskiness, defined as structure qualities of the situation, as environmental variables into account.

## **Chapter 3**

### **Situational Adaptation with Environmental Demands<sup>10</sup>**

In this study, soldiers' situational adaptation with the environment-specific demands is explored. The two needs-based personality traits, Sensation Seeking and Need for Structure, were expected to reflect situational demands on combat deployment. Certain changes on the level of those characteristics take place across deployment: soldiers who are lower in Sensation Seeking were more inclined to seek for sensations after deployment, and soldiers at the extremes of the Need for Structure dimension, modified their behavioural tendencies after deployment towards a moderate level. According to our findings, these changes suggest temporal characteristic adaptations with certain environmental demands.

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<sup>10</sup> This chapter is based on Parmak, M., Euwema, M. C., & Mylle, J. J. C. (2011).

### **3.1. Introduction**

Soldiers' everyday life during deployment is full of strains they have to cope with. There is a wide range of environmental and physiological stressors (Kavanagh, 2005; Krueger, 2008; Reger & Moore, 2009; Thomas & Castro, 2003; Weisæth, 2003), that soldiers do not have any opportunity to control or to regulate according to their preferences. While deployed, they rather need to adjust with the increased level of risks and tightened regulations. Most soldiers indeed manage to adapt and, by doing so, avoid to become psychological casualties (Shale, Shale & Shale, 2003). In some cases the adaptation with military experience can be too absolute, which may result in the perception of civilian life back home as an extension of the war (Hendin, 1984) and create problems for the person as well as for society. Promoting healthy adaptation to threats in the environment is therefore an important part of military policy in general. We explore in this study conditions for the adaptation process, using longitudinal data from deployed Estonian soldiers in Afghanistan.

#### *Characteristic adaptations of personality*

Habituation resulting from behavioural experiences with particular stressors (Kant et al., 1985) could be viewed as an aspect of learning (Thompson & Spencer, 1966). In our research, we presume that combat operations do not barbarize soldiers as humans, for what the military is often charged, but make them habituate to their temporal new environment in terms of coping. The environment in combat deployments can be described by increased threats and chaos, but also by unquestionable regulations and a tightly organised life. By their content, two narrow personality traits, Sensation Seeking and Need for Structure, described in terms of individual needs, relate to the above-mentioned situational demands.

Although personality traits do not remain unchanged across the life course (Caspi & Roberts, 2001) and can change due to life-altering events (Legerski, Cornwall & O'Neil, 2006), in general they are still declared to be more or less immune for environmental influences (McCrae et al., 2000) and are referred to as a stable phenomenon rather than a fluctuating one. However, as there are indications too that personality traits (or their

developmental stages) can differ in their receptiveness to environmental influences (Sturaro, Denissen, van Acken & Asendorph, 2008), it makes sense to view personality as both a static and a dynamic entity, depending on its definition (Duggan, 2004).

In our approach, we rely on personality concepts that distinguish between basic tendencies (or core dispositions) and characteristic adaptations (or surface traits) (Asendorpf & van Acken, 2003; Costa & McCrae, 1994; McCrae & Costa, 1966), allowing to expect changes in the expression of dispositions in a direction that matches with functional behavioural adaptation in a particular environment. It is known that people are able to adjust their behaviour to the demands of the environment they are sojourning in even for short time, and that the extent of that adjustment is related with personal and situational characteristics (Foley, 1976). Although personality questionnaires claim to be rather *trait* than *state* measures, it is noted that people's responses may be affected by the respondents' mood (i.e. a state) at the time of assessment (Rust & Golombok, 2009, p.160). In earlier research on anxiety, another example can be found where a differentiation has been proposed between relatively stable or permanent *trait* anxiety, and transitory or acute *state* anxiety (see for example Cattell & Scheier, 1958, 1961; Spielberger, 1966). Without questioning the general stability of personality, we follow these lines of thinking and ask ourselves if soldiers' adaptive responses to specific environmental stimuli are expressions of two needs-based *traits* - i.e. need for sensations and need for structure, respectively- and thus can be viewed as *states* which are temporal by definition.

### *Sensation Seeking*

Sensation Seeking is defined by the propensity to seek intense sensations and by the willingness to take risks for the sake of thrilling experiences (Zuckerman, 1994). This propensity, however, must be differentiated from "danger invulnerability" (Ravert et al., 2009). Sensation seekers prefer challenging and novel experiences over repetitive events and familiar surroundings, and accept risks for their arousal potential but do not seek risk for its own sake (Zuckerman, 1978, 1994, 2005). Individuals high in sensation seeking are less likely to inhibit or to appropriately regulate their emotional activation when

involved in exciting activities (Joseph, Liu, Jiang, Lynam & Kelly, 2009); what may result in behaviours considered as overly risky or deemed as socially unacceptable. Although sensation seekers can be considered as problem makers, in military settings the propensity to seek sensations has several positive connotations. The higher risk acceptance is seen as a desirable quality of sensation seeking because it is useful in terror management under conditions of threat (Van den Berg & Soeters, 2009). “Adventurism” (a construct closely related with sensation seeking) is found to be related with self-efficacy during peacekeeping, and with the search for future assignments (Van Emmerik & Euwema, 2009). For higher-sensation seekers, performance during the war and subsequent long-term adjustment is better than for lower-sensation seekers (Neria, Solomon, Ginzburg & Dekel, 2000). In addition there are findings that high sensation seekers are more stress resistant, which minimizes the effects of psychological and physiological stressors (Netter, Henning & Roed, 1994).

#### *Need for Structure*

The concept of Need for Structure (Neuberg & Newsome, 1993) refers to a person’s tendency to form and to hold more simply structured (or less complex) views of the world. High need for structure is found to predispose for a lower ability to tolerate complexity in a person’s everyday life (Meertens & Lion, 2008; Neuberg & Newsome, 1993), and can explain a person’s situational preferences as well as the extent of desired environmental regularity (Moskowitz, 1993). People scoring high on Need for Structure inventories prefer clear and predictable situations over complicated and indefinite ones (Neuberg & Newsome, 1993). They tend to enjoy simple environments with tightly organized life and try, at least in their own perception, to manage their life in an orderly fashion (Gordon, 1997; Schaller, Boyd, Yohannes & O’Brien, 1995). Although a high need for structure may be perceived as overall valuable in the military “chain of command” and in “all supplies guaranteed” environments, it might show its dark side when situations turn into complex or unpredictable ones. This drawback of being a structure seeker was confirmed in the study by Van den Berg and Soeters (2009) who found that soldiers scoring high on this trait are able to tolerate the risk of dying in non-threatening situations but lose this tolerance when situations become life-threatening.



### *Situational adaptation*

The concept, the definitions and the terminology of adaptation are complicated and are not always plainly understood (Biesecker & Erby, 2008; Schmitt & Pilcher, 2004). Framing the term “adaptation” for our purpose, we rely on the evolutionary approach, where adaptation means generally the process of changes in an organism to conform better with (new) environmental conditions in order to enhance their survival chances (Bijlsma & Loeschke, 2005). These changes are even observable at the spermatozoon level (Shackelford & Goetz, 2007). To minimise any deterioration of the fit in the case of changed environmental conditions - which initially creates a mismatch between person and environment - an adjustment or adaptation of behaviour occurs, such as influencing the environment, changing oneself and one’s self-perception, or becoming able to continue without changes (Griffin & Hesketch, 2003). Any condition that significantly threatens one’s health leads to stress and requires adaptation in order to cope with it (Biesecker & Erby, 2008). However, even in extreme situations, the adaptation process can be successful and lead to psychological growth (Matthew, 2008).

The adaptability of military personnel as a context-specific expression of personality is significantly related with their performance (Bilgiç & Sümer, 2009), indicating that being contextually adaptive in a military world is an effective way to cope with its demands. For a person working in diverse and rapidly changing military environments, the ability to adapt is of vital importance. Expectations and appraisals are instrumental to psychological adaptation; soldiers who are less able to align in the light of operational reality may experience more adjustment problems (Thompson & Pastò, 2003). The relevance of sensation seeking and need for structure propensities in a military environment was shown by Parmak, Mylle and Euwema (2011a) in whose research relations were found between those two traits and the perception of situational risks and predictability of events.

### **3.2. Methodology**

In the case of intense military operations, the deployment context is characterized by an increased level of risks and threats. At the same time a lot of activities in the deployment

area are also tightly organised (i.e. strategically planned and tactically well prepared). In that sense, soldiers could perceive the same environment simultaneously as chaotic and structured. Although it seems contradictory, they need to adjust their behavioural standards for both environmental peculiarities. This adaptation can be achieved through an increased tolerance of sensations, as well as an increased tolerance for structure. That is, the self-perception of deployed soldiers modifies as function of their experiences during deployment. If they are able to cope with the demands of a highly chaotic and strongly structured environment, their personal level of need for structure and sensation seeking will adapt with those demands. As a result, they will report higher levels of sensation seeking as well as a higher need for structure shortly after the deployment experience and before the re-adaptation to daily life in the home country will take place.

We hypothesize that, compared with their respective baseline (i.e. before deployment), soldiers' propensities to search for sensations (sensation seeking) (H1a) and to search for structure (need for structure) (H1b) are higher shortly after the deployment (vs. before deployment). Adaptation to an increased level of threats as well as to strengthened regulations in an operational environment is most likely to occur to soldiers who are at low extreme in those traits, as they experience a wider gap between their personality related needs and the environmental demands. Based on this idea, we expect that soldiers for whom the risky and life-threatening environment is less acceptable in regular life (i.e. they are low in sensation seeking) will "lift up" their sensation seeking tendencies; and soldiers to whom the strongly regulated and well-structured environment is less preferred in their regular life (i.e. they are low in structure seeking) will increase their tolerance to irregularity and chaos. Taken together, we hypothesize that these propensities increase among low- but not among high sensation seekers (H2a), and among low- but not among high structure seekers (H2b).

#### *Participants and procedure*

Our sample for this study (n=192) consisted of three rotations of Estonian males<sup>11</sup>, all professional soldiers, deployed for a 6-month military mission to Afghanistan. Only

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<sup>11</sup> Data of one deployed female soldier were excluded from analysis.

participants whose pre- and post-deployment data were available were included in the analysis. The age of our subjects ranged from 18 to 50 years ( $M = 25.1$ ,  $SD = 5.2$ ), and education, expressed in years, varies from 9 to 18 ( $M = 12.4$ ,  $SD = 1.8$ ). For all rotations, a psychologist collected baseline data (T1: first assessment) during the pre-deployment training course in their home garrison in Estonia approximately two months before departure to Afghanistan. A second wave of data (T2: second assessment) was collected within a week after they returned back from Afghanistan to their home garrison in Estonia. During the first wave of data collection, the importance of soldiers' collaboration in the research was explained (with the right to decline their participation) and personal feedback was provided. The feedback contained participants' personality profiles only and did not include possible consequences of their adaptation with the deployment environment.

### *Measures*

The *Sensation Seeking Scale V* (SSS-V, Zuckerman, 1978; 2005) was used for the assessment of the sensation seeking propensity (SS) in our study. The SSS-V is a 40-item forced choice questionnaire that measures the degree to which a person seeks novel and adventurous experiences. The instrument is psychometrically reliable (Roberti, 2004; Roberti, Storch & Bravata, 2003; Zuckerman, 2007), proven to be cross-culturally valid (Zuckerman, Eysenck & Eysenck, 1978), and has been tested also in the Estonian military population (Parmak, Mylle & Euwema, 2011a). Scoring higher on SSS-V indicates a higher sensation-seeking tendency (Zuckerman, 1978).

The *Personal Need for Structure* construct (PNS, Thompson, Naccarato & Parker, 2001; Neuberg & Newsome, 1993) is found to be reliable in civilian (Meiser & Machunsky, 2008) as well as military population (Parmak, Mylle & Euwema, 2011a) and was used for the assessment of need for structure propensity (NS) in the current research. This inventory consisted of 11 of the original 12 scale items (item 5 was dropped; see Neuberg & Newsom, 1993). The instrument assesses the degree to which a person prefers a simple structure, organization and clarity. Higher scores on the PNS scale indicate a higher structure seeking tendency (Neuberg & Newsome, 1993).

### 3.3. Results

Preliminary analyses were conducted to obtain descriptive statistics and correlations between the assessed personality traits in the base-line condition (T1) and in the after deployment condition (T2). Data for both traits were normally distributed in both testing sessions (T1 and T2) and correlated significantly: SS at T1 was significantly and positively correlated ( $r = .67, p < .001$ ) with SS at T2, and negatively with NS at T1 ( $r = -.27, p < .001$ ) and at T2 ( $r = -.33, p < .001$ ). NS at T1 was significantly and positively correlated ( $r = .53, p < .001$ ) with NS at T2. The Levene's test of homogeneity of variances revealed no differences in homogeneity of the assessed variables for the three rotation sub-samples. In addition, the Sheffé's test was used to confirm that there were no differences between tested rotations.

#### *Changes in sensation seeking and need for structure in the whole sample (H1a; H1b)*

According to our first hypothesis, soldiers' SS propensity (H1a) and NS propensity (H1b) increase across the deployment compared to their baseline propensity. To check this, a related  $t$  test (repeated measures) was conducted between T1 and T2 conditions. Analysis revealed that the mean scores of soldiers' Sensation Seeking propensity increased across the deployment (T2:  $M = 21.2, SD = 5.5$ ) compared to their base-line condition (T1:  $M = 19.7, SD = 5.0$ ). This increase was statistically significant,  $t(190) = -5.034, p < .001$ , two-tailed. The effect size (Cohen's  $d = 4.312$ ) is large according to Cohen (1988). This confirms our hypothesis H1a. However, contradictory to our expectations, no statistically significant change ( $t(188) = 1.616, p > .1$ , two-tailed) in NS was detected between T1 ( $M = 29.6, SD = 4.2$ ) and at T2 ( $M = 29.1, SD = 4.2$ ) in our sample. Hypothesis H1b is thus not confirmed.

*Changes in sensation seeking and structure seeking propensities within Low, Moderate and High SS groups (H2a) and NS groups (H2b)*

To explore the hypothesised differences between changes in “low to high” SS subjects (H2a) and in “low to high” NS (H2b) subjects across the deployment, we divided the whole sample into as equal as possible sub-samples (according to the frequency tables of participants’ SS and NS baseline scores). For following analyses, we obtained three groups of sensation seekers: Low SS (n=65), Moderate SS (n=70) and High SS (n=56); and three groups of structure seekers: Low NS (n=57), Moderate NS (n=71); and High NS (n=63). Next, a repeated measure ANOVA with a 2 x 3 design was performed separately for SS and NS respectively. As repeated measure factor we used respondents’ scores at T1 and T2, and as differentiating variable the Level (Low, Moderate and High) of SS and NS respectively. In Table 3.1 means at T1 and T2 within Low, Moderate and High SS/NS groups are described.

Regarding SS, in addition to a significant main effect of time ( $F(1,188) = 23,95; p < .001$ ) there was a significant ordinal interaction effect between Time and Level ( $F(2,188) = 8,00, p < .001$ ). The increase in SS score from T1 to T2 is the biggest at the Low Level, less at the Middle and (nearby) zero at the High Level. The occurred changes are different between the “low to high” groups. This confirms our expectation (hypothesis H2a) that sensation seeking propensity increases notably among low- (T1:  $M = 14.31, SD = 2.8$  and T2:  $M = 17.06, SD = 4.7$ ) but not among high sensation seekers (T1:  $M = 25.63, SD = 2.5$  and T2:  $M = 25.41, SD = 3.9$ ).

Regarding the NS-levels, a significant disordinal interaction between Time and Levels ( $F(2,186) = 27.59, p < .001$ ) was found.). As shown in Table 1 the mean increases from T1 to T2 in the Low Level, remains (nearby) unchanged at the Middle Level, and decreases at the High Level (confirming H2b) (T1:  $M = 24.54, SD = 2.5$  and T2:  $M = 26.66, SD = 4.6$ ). A remarkable decrease in NS propensity took place in the high NS group (T1:  $M = 34.06, SD = 2.0$  and T2:  $M = 31.25, SD = 3.4$ )

Table 3.1 Differences in means at T1 and T2 within Low, Moderate and High SS/NS groups

	Propensities							
	Sensation Seeking (SS)				Need for Structure (NS)			
	T1		T2		T1		T2	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Low	14.31	2.8	17.06	4.7	24.54	2.5	26.66	4.6
Moderate	19.86	1.4	21.77	4.5	29.49	1.1	29.01	3.3
High	25.63	2.5	25.41	3.9	34.06	2.0	31.25	3.4

Note. T1—means and standard deviations at the baseline, T2—means and standard deviations shortly after the end of deployment

In addition to the expected increase in means of the assessed traits in “low” SS and NS groups respectively, there is a systematic increase present in all groups’ standard deviations of both SS and NS from T1 to T2 (see Table 3.1). Considering the mediating role of the autobiographical memory between traits and adaptations (Sutin, 2008) this may refer to a somewhat blurred and potentially confusing self-image after deployment experience.

### 3.4. Conclusions

Sensation Seeking is referred to as a biologically rooted individual *trait* (Roberti, 2004; Zuckerman, 1994; Zuckerman, 2004; Zuckerman, 2005), and Personal Need for Structure as a stable personality characteristic across situations (Neuberg & Newsome, 1993; Thompson, Naccarato & Parker, 2001); in this sense, they are traits. In accordance with evolutionary principles, in order to survive, organisms must be able to adapt themselves physically and psychologically to fit with changed circumstances (Schmitt & Pilchner, 2004). Our results are well in line with new generation personality theories discerning between basic tendencies and characteristic adaptations (Asendorpf & van Acken, 2003; Costa & McCrae, 1994; McCrae & Costa, 1966) contending that observed changes can

be viewed as characteristic adaptations with certain environmental demands. Based on the differentiation between *traits* and *states* in terms of stability over time and across situations as known from anxiety research (Spielberger, 1966) it can be suggested that altered need for sensations and for structure are functionally *effective trait expressions*; - i.e. *states*, being temporal by definition.

The expected adaptation of soldiers in terms of showing a better fit to environment (Schmitt & Pilcher, 2004) was found to take place in combat environments where propensities to tolerate intense sensations and tight regulations are highly functional. A potential mechanism of this adaptation is provided by findings that self-defining memories mediate between basic tendencies and characteristic adaptations (Sutin, 2008). Soldiers who score low on sensation seeking or on need for structure respectively before combat experience; define themselves as different after such experiences. After having been deployed to high intensity military operations, they are more willing to accept risks and to prefer structured environments. A decrease in propensity among the high NS may serve them as a way to cope with an unavoidable environment that is too complex, and which is not suited to them, and might be explained by a high level of threats in the deployment area. People high in NS are sensitive to fear under extreme threats (Van den Berg & Soeters, 2009), and need to adapt for the mere sake of psychological survival. The finding makes sense as part of an adaptation process, although not hypothesised. The deployment environment is indeed highly regulated on the one hand, but is still irregular and close to chaos, on the other hand. For both extremes of the structure-seeking dimension it seems feasible to adapt to the environmental conditions but as environmental irregularity seems to overrule the established regulations, adaptation is more vital for the high structure seekers. However, to serve as a possible interpretation, this phenomenon needs to be further explored.

These adaptations, very useful during deployment, may create potentially serious adjustment problems when back home. An increased need for sensations may be expressed in socially unacceptable behaviours (e.g. speeding, feasting), and is often quite noticeable within their immediate environment, particularly for those people who do not

normally behave this way. Furthermore, a strengthened need for structure may condition an inability to restore one's place and take back one's responsibilities in the peacetime environment, which is more loosely organised and less regulated. Association with habituation allows us to presume that the change is temporary (thus a state) and not permanent (thus not a trait) because habituation is reversible. The confrontation with other types of stimuli will result in dishabituation, and after repeated applications, results in "habituation of dishabituation" (Thompson & Spencer, 1966). Thus, if the change in behaviour is a consequence of situational adaptation, one could expect that, sooner or later, an individual will adapt back to his normal environment.

While an increased need for structure does not involve objective risks to soldiers' health or life, an increased need for sensations refers to higher risk-propensity for at least some period after the deployment. Although they still score substantially below soldiers' average, their sensation-seeking propensity may need to be regulated because of the contrast between "before" and "after". Providing them with an adequate source of stimulation via non-risky types of activity can reduce their involvement in other undesirable forms of risk-taking (Roberti, 2004). Also, offering temporarily less conventional and less routine settings of work (Reio & Sanders-Reio, 2006) can reduce potentially negative consequences related with an increased need for sensations.

Armed Forces from several countries already make use of specific psycho-education programs and activities for soldiers returning from intense combat mission to assist them to re-adapt back to the social norms of the home country and to the work routines in garrison. One method, already widely used, is the so-called Third Location Decompression (TLD). This refers to a process designed to allow to the service personnel returning from deployment to adapt to the home environment in a graduated way, with the aim of reducing the potential for maladaptive psychological adjustment (Hacker Hughes et al., 2008). It is found that although the operational definitions vary across countries, providing some form of decompression to service members returning from battlefield is generally proven to be successful (Castro, Greenberg & Vigneulle, 2009). Another project which can be viewed as a practical test of our results, is the Army



Warrior Adventure Quest (WAQ) developed by the U.S. Armed Forces<sup>12</sup>. The WAQ is a training tool designed to introduce soldiers to activities that serve as alternatives to aberrant behaviours often associated with accidents involving recently re-deployed soldiers, and presents coping outlets to help those soldiers to realize their own new level of normality and “move on” with their lives. Preliminary data regarding four WAQ activities (paint-balling, rock climbing, skiing, and scuba diving) are encouraging in the sense soldiers’ increased feeling of confidence through learning new skills. These activities were evaluated by the participants as stimulating (WAQ Preliminary Data, Feb 2009, *unpublished*). Hopefully our research provides an additional scientific justification for those practices, by describing the potential mechanism of the modified behavioural tendencies.

Focusing on personal growth, there can be another possible explanation for our findings. Oliver Wendell Holmes (1841-1935), poet, physician, essayist and founding father of “Outbound Training”, said “*A mind that is stretched by a new experience can never go back to its old dimensions*”. Deployment is a learning experience for many soldiers. They are still very young people, and make adaptations to their self-image based on their experiences. Generally speaking, the results can be interpreted as positive adaptations by young people (Matthews, 2008), who learned that (a) they like adventure more than they thought; (b) those who dislike structure, appreciate structure more after deployment, (c) those who are extremely high NS, become more tolerant for uncertainty. Following the line of thinking that “A mind that is stretched by new experience...” it is beneficial to motivate returning soldiers to continue with a good mixture of structure and challenge in the task environment. As illustration we present an example about an old soldier, who was deployed once during his military career to Bosnia-Herzegovina. He had never left his homeland before, and preferred to spend his spare time and holidays with fishing, always in the same spot. He was afraid to go on deployment, but afterwards he considered his experience as positive. Most likely he saw himself a bit less in need of structure because he became more tolerant to the changing world surrounding him.

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<sup>12</sup> see <http://www.hood.army.mil/resiliencycampus/Warrior.aspx>

### *Limitations and opportunities*

The present research has several limitations but also reveals opportunities for further research. We found the increased need for sensation across a deployment cycle using self-administered personality tests; this leads – at least potentially - to biased responses due to the respondent's subjectivity. Sensation seeking as a biologically rooted personality trait can be verified using biological markers. This technique is not totally perfect (Voracek, Tran & Dressler, 2010) but using biological markers would give us a more objective picture of what exactly happens before, during and after the deployment. Also, the present study misses a control group of deployable soldiers although not deployed yet. Moreover, the actual study does not answer the question whether or not the low sensation seekers' increased propensity to take risks, and the higher need for regulation in the mind of low structure seekers, drop back to the baseline values during the months following the homecoming; drop which one would expect (i.e. a change of state), or if the change remains rather stable for a longer period, reflecting a more permanent change (i.e. a change of trait). In summary, a longitudinal approach over a longer period is needed to prove the temporal character of the observed changes. Also, follow-up research would benefit from exploring the potential change of other personality traits which would be assumed not to change across deployment and proving so that indeed SS and NS are really influenced by the situational requirements of an operational deployment. However, the value of our findings in terms of practical implications for the Armed Forces calls for further research where (1) more troops are involved, (2) biological markers are used, (3) data from control group are included, (4) a variety of personality traits are explored and (5) a long term follow-up phase is included to estimate the persistence of changes, with and without application of re-adaptation programs.

## **Chapter 4**

### **Well-being in the Context of Military Deployments<sup>13</sup>**

Person-environment fit is used in this study to understand well being of deployed soldiers. The relation between personality traits Sensation Seeking and Need for Structure, and psychological well being of Estonian soldiers ( $n=168$ ) was examined before and after the ISAF mission in Afghanistan. We found that psychological well being decreased during deployment and soldiers' personality moderated this decrease. Strong decrease appeared among soldiers low in need for structure, combined with high need for sensation seeking. Results suggest that to increase soldiers' mental resilience, applying a more individual-based approach is beneficial in pre-deployment training as well as in post-deployment interventions.

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<sup>13</sup> This chapter is based on Parmak, M., Mylle, J. J. C., & Euwema, M. C. (2011b).

#### **4.1. Introduction**

The theatre of modern military missions is complex and dynamic, with often high levels of risks and threats but also with repeated routine tasks. Typical for the working environment in operations is a combination of uncertain and threatening situations (e.g. a fire contact with Taliban during social patrols), and lots of standardized, routine tasks (e.g. exercising all kinds of drills at the base, inactivity, or standing guard at the gate of the compound). Therefore, the environment in modern military deployments can be described as full of unavoidable threats and chaos, simultaneously with unquestionable regulations and a tightly organised life; which is difficult to cope with and regularly results in serious psychological dissatisfaction and stress (Mæland & Burnstad, 2009). Soldiers need to adjust their behavioural standards to this specific condition: increased risks and uncertainties in combination with stronger regulations and routines. To be able to adjust, the soldier has to create a fit between the perception of these tasks and their self-image. In fact, recent research supports the idea that, soldiers are able to modify their self-perception in order to meet the double-standard challenges of deployment. They become to see themselves as more suitable for the unavoidable reality. This was for example reflected in a study among Estonian conscripts deployed in Afghanistan, who showed an increased tendency to seek for sensations, as well as a higher need for seeking structure (Parmak, Euwema & Mylle, 2011).

Circumstances that are perceived as stressful by one type of person can be experienced differently and even comfortable by another type (Adler, Brett & Bartone, 2003; Parmak, Mylle & Euwema, 2011a); in other words, in understanding responses to potentially stressful events, it is important to consider situational and personality variables simultaneously (Krueger, 2008). Routine tasks in a secure environment, which are annoying and boring for one soldier, may match perfectly with the preferences of his colleague. Conversely, a soldier who is happy in predictable and regular duties can be stressed even if he only thinks about risky and dangerous tasks, whereas others want to seek adventure and risk. In this study we explore the relation between two personality characteristics that relate directly to the two elements of the challenges caused by the complex military task environment: the uncertainty and high risk might be related with

Sensation Seeking (e.g. seeking thrills and intense sensations), whereas the strict regulations and often highly standardised tasks might be related with Need for Structure (e.g. seeking clearness and predictability). The fit between person and task should result in increased well-being at work. We were inspired for this research by experiences from the field. An experienced service member, who has been deployed several times, expressed this clearly:

*“According to my experiences, camp guard is the dullest task during deployments. Everybody tries to break free of that. If you are in a camp like /... / and depending only on your own unit, you have no choice—you have to do it. We all understand that it is necessary, but this is just depressing and makes you feeling that what you are doing is senseless; besides it is not interesting at all. Although there are people in every deployment who participate just for money and try to have a quiet and secure deployment, there are still lots of people who engage for some action. They are interested in what is outside of the camp, how the nature looks like, the way locals live, etc. Of course, as a task, camp-guarding is more secure—no risk to step on an IED (improvised explosive device), however, it is boring and leaves you with the feeling of meaninglessness.”*

Recently, an integrated military demand-resource (MDR) model was described by a group of researchers as a comprehensive framework to understand and to maintain psychological fitness for the total forces (Bates et al., 2010). Their approach relates psychological fitness with optimal performance and stronger resilience; they contend that it can be developed using the same training principles as for physical fitness. According to the authors, to understand the effectiveness of psychological fitness programs, a critical question to answer is “what works for whom?” Hancock and Szalma (2008) have stated that individual differences in personality are source of behavioural variation, especially in times of stress, and that these differences are neither fully reduced nor reducible through drill and expertise. However, we believe that the person-environment fit theory helps us partly to answer the critical question asked above, providing hints how we could benefit from more individualized training programs.

Psychological well-being is an important factor for a happy existence, healthy life and productive work performance (Boehm, 2008; Edwards & Cooper, 1988; Ilies, Schwind & Heller, 2007; Koopmans, Geleijnse, Zitman&Giltay, 2010; Lyubomirsky& Boehm, 2010; Wood & Stephen, 2010; Wright & Cropanzano, 2000). Psychological well-being can be viewed as a state (Feist, Bodner, Jacobs, Miles & Tan, 1995) which is related to the person's appraisal of the specific environment as disturbing or challenging (Priest, 1992; Ewert & Hollenhorst, 1989; Hanton, Evans & Neil, 2003) and by doing so reflects the degree of fit between personality and environment. Given that pre-deployment training is the same for all deployed soldiers, we decided to explore if and how needs-based personality predispositions may 1) foster or 2) challenge the individual fitting with the conflicting deployment demands. Thus, in our research we explore, if and how Sensation Seeking (looking for thrill and novelty) together with Need for Structure (looking for stability and regulations) contribute to soldiers' psychological well-being before (*pre-deployment*) and after (*post-deployment*) combat exposure in a deployment area like the Helmand province in Southern Afghanistan, which is currently a field of intense military activity as part of the counter-insurgency strategy.

#### *Sensation Seeking and Need for Structure*

Sensation Seeking is defined by the propensity to seek intense sensations and by the willingness to take risks for the sake of thrilling experiences. Sensation seekers prefer challenging and novel experiences over repetitive events and familiar surroundings (Zuckerman, 1978, 1994, 2005). The higher risk acceptance is seen as a desirable quality of sensation seeking because it is useful in terror management under conditions of threat (Van den Berg & Soeters, 2009). High sensation seekers are also more stress resistant (Netter, Henning & Roed, 1994) and better performers during the war than low sensation seekers (Neria, Solomon, Ginzburg & Dekel, 2000).

People scoring high on Need for Structure prefer clearly defined and predictable situations over complicated and indefinite ones (Neuberg & Newsome, 1993). They tend to enjoy simple environments with tightly organized life and try to manage their life in an orderly fashion (Gordon, 1997; Schaller, Boyd, Yohannes & O'Brien, 1995). Although a

high need for structure may be perceived as overall valuable by the military “chain of command” and in “all supplies guaranteed” environments, it might show its dark side when situations become life-threatening (Van den Berg & Soeters, 2009).

## **4.2. Methodology**

### *Hypotheses*

A high intensity conflict environment is not the easiest place to idling away time; considering the demands of combat deployment (Bartone, 2005) it is an emotionally and physically exhausting experience, as reflected afterwards in increased frequency of common mental disorders and alcohol misuse (Fear et al.,2010). Although deployed soldiers differ according their coping resources, one way or another, a long period in a risky and restricted environment is demanding for all of them. In our research we expect that (H1) the level of well-being in general is lower after the deployment (T2) compared with its level assessed on pre-deployment (T1).

Generally, military training is about preparation for action and about how to handle threats, but not about how to sustain boredom and comply with routines or how to cope with an increased level of restrictions. We hypothesise that (H2) soldiers who are low in need for structure, irrespective of their sensation seeking propensity, will show a significant decrease in psychological well-being after deployment. In other words, we expect to find an interaction effect between the categories of NS and the mismatch between expectations and experience expressed as before (T1) and after (T2) the deployment

Soldiers are normally able to adapt their needs-based dispositions according to environmental demands (Parmak, Euwema & Mylle, 2011). However, for some profiles it can be more challenging than for others. In our research we assume (H3) that some particular combinations of SS and NS profile groups do better (i.e. show less decrease in well-being) than some other groups. In other words, an interaction effect is expected between the categories of NS and SS on well-being at T1 and T2.

### *Participants and procedure*

Our sample for this study consisted of three rotations of Estonian males, all professional soldiers who deployed from 2007 to 2009 for a 6-month tour-of-duty to Afghanistan. To mitigate the impact of uncontrollable environmental parameters related to particular features of a single deployment (e.g. leadership, mission objectives, and incidents), our research encompasses longitudinal data (T1, T2) from three successive rotations of the Estonian detachments—each composed of different soldiers — deployed into the same region in Afghanistan, (i.e., the Helmand province) for the same mission (ISAF).

After excluding participants for whom well-being data after the deployment (T2) were not available, our final sample included 168 soldiers in total ( $n = 67$ ,  $n = 48$ ,  $n = 53$ , for the first, second and third rotation respectively). The age of the subjects ranged from 18 to 45 years ( $M = 25.3$ ,  $SD = 4.7$ ), and education, expressed in years, varied from 9 to 18 ( $M = 12.3$ ,  $SD = 1.8$ ). Participants' previous deployment experiences ranged from 0 ( $n = 86$ ) to 6 ( $n = 1$ ) deployments, and average years of service from 1 to 17 ( $M = 4.6$ ,  $SD = 3.7$ ). For all three rotations, the baseline data (T1) were collected during pre-deployment training, two month before departing for deployment. The second measurement (T2) took place within two days after the unit was arrived from deployment back to Estonia. Data were collected in a classroom setting by the psychologist as a part of a psychological briefing. Participation was voluntary, no informed consent was required. No measures to detect biased responding were used but responders' anonymity was guaranteed and a personal feedback was provided to motivate soldiers to co-operate.

### *Measures*

In our study, the Sensation Seeking Scale V (SSS-V, Zuckerman, 1978; 2005) was used for the assessment of sensation seeking as a narrow trait (SS). The SSS-V is a 40-item forced choice questionnaire that measures the degree to which a person seeks after novel and adventurous experiences. The instrument is psychometrically sound (Roberti, 2004; Roberti, Storch & Bravata, 2003; Zuckerman, 2007), and proven to be cross-culturally stable (Zuckerman, Eysenck & Eysenck, 1978). The total score of sensation seeking is obtained by adding up the scores on the subscales representing the different sensation



seeking components. Scoring higher on the SSS-V indicates a higher sensation seeking tendency. The instrument has been validated in the Estonian military population (Parmak, Mylle & Euwema, 2011a).

The Personal Need for Structure inventory (PNS, Neuberg & Newsome, 1993; Thompson, Naccarato, Parker & Moskowitz, 2001) assesses the degree to which a person prefers a simple structure, organization and clarity. The instrument is found to be valid in the civil (Meiser & Machunsky, 2008) as well as in the military Estonian population (Parmak, Mylle & Euwema, 2011a) and was used for the assessment of need for structure (NS) in the current research. This inventory consisted of 11 out of the original 12 scale items (item 5 was dropped; see Neuberg & Newsom, 1993). The total score being the sum the scores on the two subscales representing the two different aspects of need for structure; higher scores on the PNS indicate a higher need for structure tendency.

The World Health Organisation Well-being Index (WHO-5) was used to assess psychological well-being. The “WHO-5” is a short, one-dimensional questionnaire with five statements (example item: I have felt cheerful and in good spirits) with the possible total score varying from 0 to 25; a higher score refers to a better well-being. This instrument has been mostly used in clinical samples (e.g. Bonsignore, Barkow, Jessen & Heun, 2001), including also an Estonian one (Sisask, Värnik, Kõlves, Konstabel & Wasserman, 2008) as a screening tool for depression and suicidal ideation. However, it is found that WHO-5 does measure not only the absence of symptoms but also the level of well being (Bech, Olsen, Kjoller & Rasmussen, 2003), and has thus sufficient construct validity. The internal consistency (Cronbach’s  $\alpha$ ) was good in our study ( $\alpha = .83$ ) and the “WHO-5” results were stable across both testing periods ( $r = .44, p < .001$ ).

### **4.3. Results**

Soldiers’ well-being in general was not significantly related to their level of SS (T1:  $r = .03, n.s.$ , T2:  $r = .07, n.s.$ ) or NS (T1:  $r = -.16, n.s.$ , T2:  $r = -.08, n.s.$ ). Correlations, however, were in different directions and somewhat higher for NS than for SS. in both testing sessions. The hypothesized decrease in level of soldiers’ well-being from T1 to T2

was observed in the total sample: they felt less well after the deployment ( $M = 17.6$ ,  $SD = 4.1$ ) than before the deployment ( $M = 18.7$ ,  $SD = 3.7$ ) and this change was significant ( $t(166) = 3.432$ ,  $p < .001$ ). This supports our first hypothesis (H1). It must be noted that the number of previous deployments did not affect the variability in soldiers well-being scores neither at T1 ( $R^2 = .040$ , *n.s.*) nor T2 ( $R^2 = .026$ , *n.s.*), suggesting that change in well-being is not about the (mis)match between expectations and experience. Descriptive statistics of study variables and their inter-correlations are represented in Table 4.1.

Table 4.1 *Descriptive statistics and inter-correlations of the variables in this study (n = 168).*

	<i>M</i>	<i>SD</i>	NS	WB(T1)	WB(T2)
SS	19.43	5.19	-.41*	.03	.07
NS	27.32	4.26	-	-.16	-.08
WB (T1)	18.69	3.67		-	.44*
WB (T2)	17.60	4.07			-

*Note.* SS – sensation seeking, NS – structure seeking; WB (T1) – well-being before deployment, WB (T2) – well being after deployment

$P < .001$

To assess if and how the observed decrease in well-being can be related to personality predispositions we allocated all participants according to frequency tables of their SSS-V and PNS scores into nine profile groups, with a more or less equal number of respondents in each group, by combining low need for sensations (LSS,  $n = 60$ ;  $M = 14.2$ ,  $SD = 3.0$ ), moderate need for sensations (MSS,  $n = 53$ ;  $M = 19.6$ ,  $SD = 1.1$ ), high need for sensations (HSS,  $n = 55$ ;  $M = 25.2$ ,  $SD = 2.8$ ), with low need for structure (LNS,  $n = 53$ ;  $M = 22.5$ ,  $SD = 2.5$ ), moderate need for structure (MNS,  $n = 61$ ;  $M = 27.4$ ,  $SD = 1.1$ ), high need for structure (HNS,  $n = 54$ ;  $M = 31.9$ ,  $SD = 2.2$ ). Reflecting the negative correlation between SS and NS ( $r = -.41$ ,  $p < .001$ ; see Table 4.1), groups with contrasting extremes (low-low and high-high) contain the least number of participants ( $n = 12$  and  $n = 10$  respectively), while complementary extremes (high-low and low-high)

show to be the most numerous ( $n = 25$  in both cases). Table 4.2 presents the descriptive statistics (means and standard deviations) of independent (profile groups) and dependent (well-being at T1 and T2) study variables in each of the nine profile groups.

Table 4.2 *Descriptive statistics of T1 and T2 in SS/ NS profile groups*

		LNS			MNS			HNS		
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
LSS	T1	12	19.1	4.4	23	18.1	3.6	25	18.6	3.3
	T2		18.1	3.2		17.0	4.6		17.4	5.0
MSS	T1	16	20.2	3.5	18	16.5	4.7	19	18.9	3.2
	T2		18.4*	3.0		15.9	4.5		19.1	2.5
HSS	T1	25	19.8	2.7	20	19.7	2.5	10	16.2	4.8
	T2		17.3*	4.8		18.8	2.4		16.2	4.1

*Note.* SS – sensation seeking, NS – structure seeking; T1 – well-being before deployment, T2 – well-being after deployment;

\* Differences between T1 and T2 are significant ( $p < .05$ )

At first data was examined using Analysis of Variance (ANOVA) with a 3 x 2 variables for both personality variables (SS [low, moderate, high] × Time [before, after] and NS [low, moderate, high] × Time [before, after]). There was no significant main effect for Sensation Seeking ( $F(4, 324) = 0.21, p = .931$ ) nor for Need for Structure ( $F(4, 324) = 1.74, p = .142$ ) on the well-being level regardless of the time points, suggesting that separately, there is no influence of SS and NS on the deployment effect of well-being. To illustrate the dynamics of changes, Figure 4.1 presents well-being levels at T1 and T2 among SS (Figure 4.1a) and NS groups (Figure 4.1b).

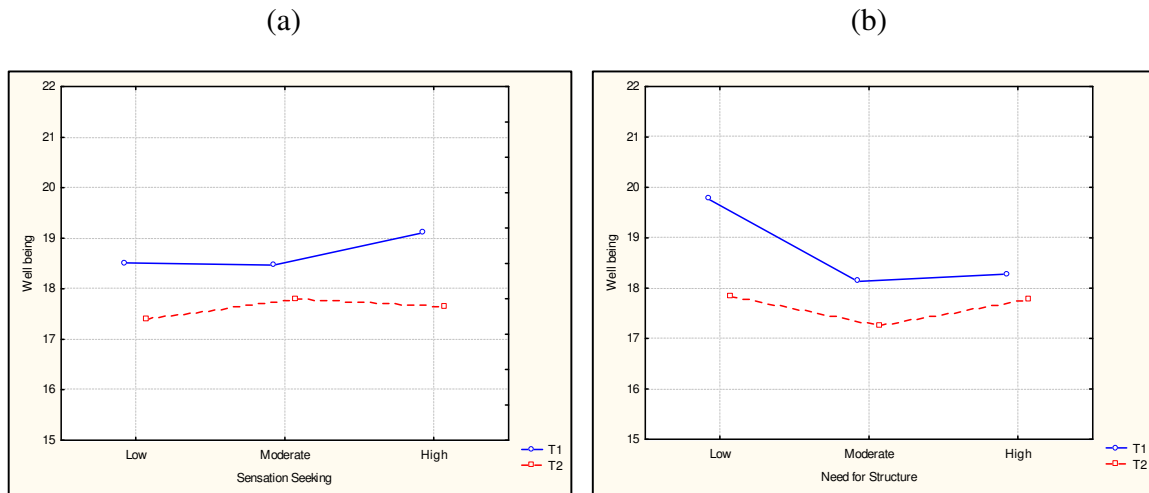


Figure 4.1 *Illustrated dynamics of well-being within SS (a) and NS (b) groups*

The differences in scores were then examined with a  $3 \times 3 \times 2$  (SS [low, moderate, high]  $\times$  NS [low, moderate, high]  $\times$  Time [before, after]) ANOVA design. Results revealed a significant interaction effect ( $F(8, 316) = 2.00, p < .05$ ) between the combination of profile groups (NS/SS) and soldiers well-being before (T1) and after (T2) deployment. Figure 4.2 illustrates the results within the  $3 \times 3 \times 2$  conditions and highlights the dynamics of change over time as function of the categories of the two traits.

Figure 4.2 (a) shows that low structure seekers (LNS) felt themselves better than other profile groups at T1. However, supporting our second hypothesis (H2), their well-being after deployment (T2) also dropped more compared with other profile groups. Compared to the LNS profiles, soldiers who are moderate in their structure seeking (MNS) did reasonable well (Figure 4.2b) at all sensation seeking levels. The decrease in well-being in T2, although present, was not as strong as was found in the LNS profile. Contrarily, soldiers with high need for structure (HNS) survived best in the sense of psychological well-being (Figure 4.2c). For this profile (except in combination with low SS) changes in well-being were null; they came back at the same level of well-being as they left.

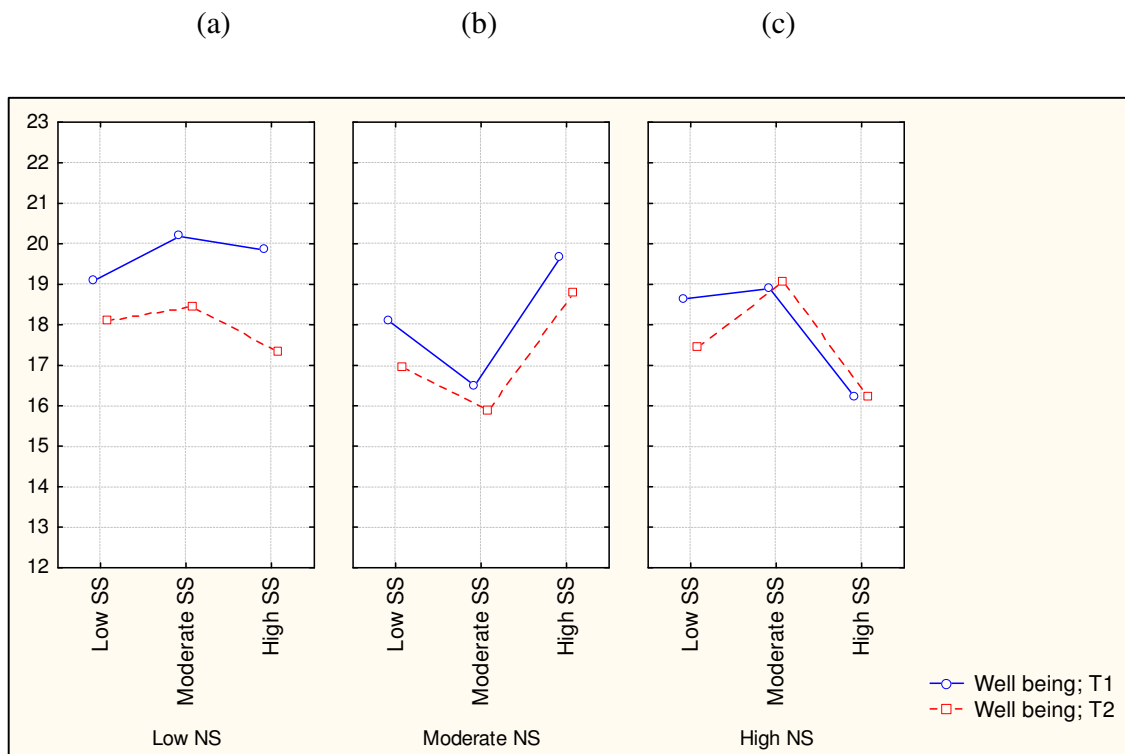


Figure 4.2 *Illustrated dynamics of well-being within nine profile groups*

Providing support to our third hypothesis (H3), there was an interaction effect found between the SS profiles, NS profiles and T. The decrease in T2 compared with T1 was statistically significant if LNS was combined with MSS, ( $t(16) = 2.70, p < .05$ ) or with HSS, ( $t(24) = 2.744, p < .05$ ). The reported level of well-being on their return was not changed at all (HNS/HSS) or was even slightly increased (HNS/MSS). Still, although not statistically significant, well being went down for one group of HNS soldiers, namely for those for whom high structure seeking was combined with low sensation seeking (HNS/LSS).

#### 4.4. Conclusions

The environment in combat deployments can be characterized by elevated risks and unpredictable incidents, but also by predictable unquestionable regulations, tightly organised life and boring camp-duties. Being simultaneously present, these contradictory conditions — chaos and order — constitute a challenge for the soldiers' psychological

adaptability. Soldiers deployed to international operations do not have any opportunity to control the intensity of events nor to choose and organize activities according to their preferences. While deployed, they are rather forced to adjust with the increased level of risks but also with more strict regulations to “survive”. For those whose personality profile is less fitting with the deployment reality, maintaining a certain level of psychological persistence across a deployment must be a harder task to fulfil. However, the military context calls for individuals with not only physical resilience but also with psychological stamina (Sümer, Bilgiç, Sümer & Erol, 2005; Sümer & Sümer, 2007).

The silent presumption for enlisters as well as for enlistees seems to be that it means only the ability to deal with risks and threats. War movies, combat stories but also commercials intended to attract potential applicants emphasise warrior resilience in terms of being tough and brave. So, the proclaimed personality profile leads to a self-selected population in defence forces. Training, by and large action-oriented, prepare them even more to deal with threats and risks, but at least not explicitly for an increased level of restrictions or overwhelming boredom. Still, even when deployed to hot-spots in Afghanistan, troops can face an unexpected reality with a restricted, boring and sometimes meaningless existence which can result in serious psychological dissatisfaction (Mæland & Burnstad, 2009).

Our findings suggest that a one size fits all approach in operational deployments is an oversimplification with negative consequences. Those soldiers who do not like their environment too much structured or regulated felt most well at regular service. However, their reported well-being decreased remarkably after they were exposed to a severely restricted environment during deployment. Although those troops may do well in garrison duties, they may experience difficulties in adapting with deployment conditions. They are not doing well at all in chaotic and risky environments.

According to personality research, in terms of the five broad dimensions, this makes sense: Conscientiousness and Neuroticism are distinctive characteristics for the types of soldiers, opposing conscripts (as representative of the general population) to professional

soldiers (Parmak, Mylle & Konstabel, 2011). More particularly, Conscientiousness (encompassing among others tidiness, orderliness and self-discipline) is negatively correlated with Sensation Seeking (Zuckerman, 1978) while Neuroticism (emotional stability and calmness), correlated positively with NS (Neuberg & Newsome, 1993). Soldiers high on both traits (HNS/HSS) confronted with the contradictory demands of the military operational environment - i.e. looking for intense sensations but also for tight regulations - did not feel well neither in garrison nor on deployment. A number of people's goals and desires may be in conflict, indeed, and thus it is impossible to satisfy them both fully (Diener, 1984). Also, soldiers who were moderate in both traits (MNS/MSS) felt themselves worse than other profiles before as well as after the deployment. It is likely that "common people" (MNS/MSS), and emotionally unstable extraverts (HNS/HSS), are the least fit for military duties in general. Well-being did not decrease for those soldiers who like well ordered environment (HNS). For them changes in well-being were null; they came back at the same level of well-being as they left (if they had at least moderate need for sensations).

The results of our research can be used in two ways. First, to increase soldiers' psychological persistence in severely restricted deployment environments compared to their home garrison, training should not only point on risks and threats, but also on coping with tight regulations, routine tasks and boredom. For now the proclaimed personality profile of the self-selected population in the military is even more amplified by action-oriented training that prepares them well for threats and risks but not for an increased level of restrictions. It might be useful to consider extra modules for specific profile groups who have proven to be the least fit to a specific deployment context. Second, support structures responsible to help soldiers to get fit again for civil society may use our findings by developing target-oriented rehabilitation programs to provide their services there, where it is most needed. Countries, where the so-called Third Location Decompression method (Hacker Hughes et al., 2008; see also <http://www.ombudsman.forces.gc.ca/rep-rap/sr-rs/tld-dtl/index-eng.asp>) is used for graduated re-adaptation may consider to apply more individual-based approach. In addition, to be more effective with respect to increasing mental resilience in their units,

military leaders may benefit from individual-based approach across the whole deployment cycle.

### *Limitations*

The small sample sets some unfortunate limitations to our study. First, we were not able to monitor an utmost interesting process; i.e. the dynamics of personality (NS and SS) within rotations because this would require to divide our sample in 27 sub-groups by adding a time variable (before, during and after deployment), leaving us on average with 6 participants in a group. One could expect that individual differences in sensation vs. structure seeking will influence soldiers' psychological persistence while coping with deployment demands fulfilling differently tasks. Research with a larger sample should be conducted to explore how individuals with a particular personality profile are coping with different service duties. Also, it must be considered that a later testing point for T2 may have yielded different results.



## **Chapter 5**

### **General Conclusions of the Dissertation<sup>14</sup>**

The dissertation is based on the presumption that the military manpower can be enhanced not only by massive recruitment, but by using the benefits of the Person x Environment approach as a force multiplier in the common military practice. Throughout the three independent, however related studies we were looking for answers if and how personality predispositions of deployed soldiers are related with their fit with the specific environment of military deployment. Setting up the study, in the first chapter the relevance of two narrow personality traits, Sensation Seeking and Need for Structure was described and the environment of international military deployment was introduced. The studies in chapters 2, 3, and 4 were conducted to investigate the mechanism by which personality intervenes in soldiers' match with the military task environment. The last, current chapter summarizes our findings and formulates six important theoretical implications and practical suggestions based on the research results.

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<sup>14</sup> This chapter is based on Parmak, M., Mylle, J. J. C. & Euwema, M. C (2011c)

### **5.1. Research Overview**

Peacetime army differs in many ways from that of an army engaged in conflict and not all soldiers who do well in peacetime service are able to function well at operational tasks (Russell, 2000). This may pose a problem for armies that have not been engaged in field activity for a long time, however, have to do so suddenly, contributing to international operations, for instance in which combat activities constitute an inherent risk. It is not of being “right” or “wrong” as a soldier - i.e. it is not the question of selecting in or out someone (leaving aside individuals not fit for duty) – rather it is the question of effective preparation and treatment; i.e. about evidence-based programs for training before deployment and for rehabilitation after deployment.

People differ according to their vocational interests, which are found to have even some genetically determined potentialities (Schermer & Vernon, 2008). Similarly to other specific occupations, the military attracts individuals with particular vocational interests. However, field stories and historical writings hint that individuals holding military positions do not belong to an as homogeneous group of people as one could expect. Russell (2000) describes two personality profiles with different reasons for joining the military and for staying in the military as well: dutiful garrison people and adventuresome battlefield people. Related to the differences for joining the army, profiles are distinguishable by their strengths and weaknesses in combat functions vs. peacetime service. Recently, the Military Demand Resources model is described as a system model that accounts for key interactions across the full range of demands and resources in predicting resilience and performance outcome (Bates et al., 2010). This model is based on the proposition that, similar to physical fitness, it is possible to identify and develop psychological fitness. It is shown that soldier’s personality predisposes how stressful the situations are perceived, and how much it may trouble his mental health.

In a series of researches, Delahaij (2009) has proven that soldiers’ personality characteristics are related with their coping under acute stress. She states that the perceived capability to cope with stress in a military task environment determines how a person appraises a stressful situation (Delahaij, 2009). Rademaker (2009) also points out

that personality is involved in all stages of the coping process and claims that soldiers who perceive more situations as threatening are subject to an increased risk for developing stress-related symptoms (Rademaker, 2009). Our research contributes further to this comprehension.

### *Main Findings*

The dissertation started with studying the mechanism of situational perception among soldiers with different personality profiles that correspond to those described by Russell (2000) as garrison people vs. battlefield people. The findings are presented in Chapter 2 (see also Figure 1.2). Two narrow personality traits, Sensation Seeking and Need for Structure, were found to be significantly related with how structured soldiers perceived their current situation. Situational structure in our research is defined as low vs. high level of predictability and of riskiness involved in the situation. Results suggest that 1) situational structure is apprehensible by the person involved in this situation; and 2) personality characteristics are involved in the process of perception of that situational structure. It is reported that Conscientiousness, found to be a good predictor of job performance as well as of deviant behaviours (Salgado, 1998, 2002), is inversely related with the specific personality traits considered (Sensation Seeking and Need for Structure) which affect soldiers' perception in an unpredictable and risky context. Soldiers higher in Sensation Seeking (which is negatively related with Conscientiousness) seem to perceive unpredictable and chaotic situations as more manageable than soldiers who score low on that trait. As soldiers are often confronted with unstructured tasks – thus unpredictable and risky situations – Conscientiousness might not necessarily be always the best dimension (of the Big Five) to be used for selection, training and evaluation. Our findings prove that the often negatively evaluated Sensation Seeking and the undervalued Need for Structure may provide an important explanation to the differences in stress level of “garrison people” and “battlefield people” respectively when facing situations with different structure. These personality measures could therefore be used for selection and job assignments.

After having explained the individual differences in perceived situational structure we verified if soldiers adapt the self-perception of their personality due to environmental characteristics. Several causes can contribute to this adaptation of the self image, including environmental stress, and coping with stressors (Biesecker & Erby, 2008). In the second study (described in Chapter 3), we asked ourselves if soldiers' adaptive responses to specific environmental stimuli reflect these two needs-based traits and thus can be viewed as trait-based states (as opposed to situation-based states). We discovered that certain changes of soldiers self-perception of their personality characteristics take place across deployment: soldiers who are low in Sensation Seeking declare themselves to be more inclined to seek for sensations after deployment than those high on that trait, and soldiers at the extremes of the Need for Structure dimension, modify their perception of themselves after deployment towards a moderate level (see also Figure 1.3). Soldiers who score low on sensation seeking (LSS) or on need for structure (LNS) before combat experience; define themselves as different after such experiences. After having been deployed to high intensity military operations, they declare to be more willing to accept risks (applies for LSS) and to prefer structured environments (applies for LNS). A decrease in propensity among the high in Need for Structure (HNS) soldiers may serve them as a way to cope with an unavoidable environment that is too complex to them, and might be explained by a high level of threats in the deployment area what they have to tolerate. For both extremes along the structure seeking dimension it seems feasible to adapt to the environmental conditions but as environmental irregularity seems to overrule the established regulations, adaptation is more vital for the high structure seekers.

According to our findings, these changes in self-perception in needs could be viewed as a successful adaptation process leading to psychological growth described by Matthew (2008) but also as effective trait expressions in states suggesting temporal characteristic adaptations with certain environmental demands and as such fits well with the approach provided by Read et al. (2010) as neural network model. The model makes an attempt to bridge the gap between personality dynamics and a dispositional approach to personality and refers to a possible integration of those approaches to personality.

After having successfully proven soldiers' capabilities to adapt their dispositional preferences to the situational demands, we aimed further at confirming our main assumption about an interaction effect between individual and situational variables on soldiers' psychological state. Namely, we were interested in how the disposition to look for thrill and novelty (Sensation seeking) together with disposition to look for stability and regulations (Need for Structure) contribute to soldiers' psychological well being before and after deployment. The study is described in detail in Chapter 4 (see also Figure 1.4). Although the presumed decrease in the level of soldiers' well-being was observed (they all felt less well after deployment), we found that soldiers' personality is related with the magnitude of changes. Soldiers who do not like their environment too much regulated (LNS) felt most well at regular service; however their well-being decreased remarkably after they were exposed to a severely restricted environment during deployment. Although those troops may do well in garrison duties, they may experience difficulties in adapting to deployment conditions. This result underscores the importance of differentiating between SS and NS. Low NS by no means results in adequate adaptation to unsecure environments; situations soldiers high on SS are attracted to.

If people's goals and desires are in conflict, it is impossible to satisfy all of them fully (Diener, 1984). Indeed, we found that soldiers high on both needs, i.e. looking for intense sensations but as well for tight regulations did not feel well, neither in garrison nor on deployment. Also, soldiers who score moderate on both traits ("common people") felt themselves worse than people with any other profile before and after the deployment. Those two profiles seem to be the least fit for military duties in general. Being exposed to deployment demands, well-being did not decrease for those soldiers who feel comfortable in well-ordered environment (high need for structure). For them, changes in well-being during deployment were absent; they reported the same level of well-being before and after deployment, however only under condition of at least a moderate need for sensations. Our findings confirm that emphasising only risks and threats as main stressors may be too simple even for intense combat deployment (Mæland & Burnstad, 2009). The most significant decrease in psychological well-being was detected among soldiers low in need for structure, especially when the latter was combined with moderate or high need

for sensation seeking suggesting that increased level of restrictions can pose psychological difficulties as well. The finding is well in line with literature about the stress and its consequences due to task insignificance or too low work load (e.g., Gaillard, 2008; Shingledecker et al., 2010).

## **5.2. Implications of our Research Results**

### *5.2.1. Theoretical implications*

*P x E fit* From a theoretical perspective, the results of the studies reported in this dissertation contribute the most to the understanding and relevance of the P x E fit, revealing the interactive mechanism between personality predispositions and demands of a particular task environment. Our findings are in line with previous research that, for each individual, there are environments which more or less match with the characteristics of his personality and which are related with his job satisfaction and well-being (DeRue & Morgeson, 2007; Greenberg, 2002; Holland 1997; Lyons & O'Brien, 2006; Pervin, 1968; Roberts & Foti, 1998; Schneider 1978). Based on Lewin's Field Theory (1935), we confirmed that different personality dispositions prove themselves as relevant indeed, as fitting in a specific task environment whereas others do not. With that conclusion we complement an array of P x E researchers who (not always with one voice about "what, how, and how much") agree that personality dispositions are not enough for predicting job performance (Edwards, Cable, Williamson, Lambert & Shipp, 2006; Fritzsche, McIntire & Yost, 2002; Fritzsche, Powell & Hoffman, 1999; Kieffer, Schinka & Curtiss, 2004; Liesing & Igl, 2007; Walschburger, 1994; Witt & Spitzmuller, 2007).

*Narrow vs. broad traits* Without elaborating here different opinions about the number or the description of personality traits (Tupes & Christal, 1992; Eysenck, 1990; Cattell & Cattell, 1995) there is a massive body of personality research that has concluded that the five-factor structure of personality (Big Five, see Goldberg, 1990; McCrae & Costa, 1995) is a useful model for the assessment of individual differences. However, the results are mixed about the effectiveness of using these broad personality traits as performance predictors (for an example, see the scientific argumentation between Ones, Mount, Barrick & Hunter, 1994 and Tett, Jackson, Rothstein & Reddon, 1994), especially if

relatively specific outcome criteria are considered (Borman, 2004). This inconsistency may be due to the broadness of the used personality constructs, to unspecified outcome criteria, and to ignoring situational characteristics of the environment where the behaviour occurs. Jenkins and Griffith (2004) have claimed that whereas both performance and personality are multifaceted constructs, predicting certain outcomes using a narrow personality traits approach, instead of a broad bandwidth framework, should be more useful. Our results reported in the dissertation, support this line of thinking, suggesting that if an (specific) outcome is expected in a specific task environment, narrow personality traits may prove to be more useful predictors of psychological coping as the broad framework, as far as they are corresponding to the demands of this particular environment.

*The relevance of Sensation Seeking and Need for Structure as distinct constructs*

Considering research related to military performance, our results add some new insights about the role of needs-based personality domains, especially the relevance of two narrow personality predispositions, Sensation Seeking and Need for Structure in diverse military task environments. People who score high in need for structure, like clear and predictable situations (Moskowitz, 1993; Neuberg & Newsome, 1993; Meertens & Lion, 2008) and try, at least in their own perception, to manage their life in an orderly fashion (Schaller, Boyd, Yohannes & O'Brien, 1995; Gordon, 1997). This was confirmed by our results where soldiers high in this need did well in severely restricted operational deployment, however were nevertheless able to adapt their self-perceived personality characteristics to tolerate environmental irregularities. High sensation seekers are said to prefer challenging and novel experiences over repetitive events and familiar surroundings, and accept risks for their arousal potential (Zuckerman, 1978, 1994, 2005). Our results also confirmed Zuckerman's findings in an operational deployment. Soldiers higher in sensation seeking were less forced to adapt their self-perceived personality being faced with risky operational environment but were not the best at coping with the other side of deployment reality – boredom and monotony.

*The relevance of the combination of Sensation Seeking and Need for Structure* Focusing on the relations between the well explored concept of Sensation Seeking and the less studied Need for Structure, we confirmed that they should not be approached as two sides of one coin but must be taken as two different personality traits describing a unique portion of a personality. Not much research can be found where the combination of these two traits is explored. As mentioned in Chapter 1, a search for relevant Subject Terms in the scientific database revealed zero studies where both of these narrow traits are studied together. Some studies, however, can be found (e.g. Meertens & Lion 2008) in which both traits are dealt with but even then those traits are studied as separate and not as combined personality factors. Our studies show that Sensation Seeking and Need for Structure are indeed (negatively) related constructs, however should be seen as differentiated personality traits. Zooming in on the combination of Sensation Seeking and Need for Structure, our results show that in a turbulent and uncontrollable environment it can be a key to understand changes in experienced well-being which is an important predictor of work performance (e.g., Taris & Schreurs, 2009), job satisfaction (e.g. Robert, Young & Kelly, 2006), and early attrition (e.g. Parker & Martin, 2009) in a wide scope of occupations. The combination of Sensation Seeking and Need for Structure, and not two traits in separate fashion, must be necessarily considered when studying outcomes in an extremely structured (well-defined, predictable, well-guided and unambiguous) environment or in an extremely unstructured (ill-defined, novel, complex and changing) situation, or when studying performance in occupations where both of these extremes are simultaneously present . Our results emphasise that Sensation Seeking and Need for Structure must be taken (and measured) as different traits and that their combination in a profile has important implications not only for military but for many civilian occupations.

*Personal growth* Any condition that significantly threatens one's health leads to stress and requires adaptation in order to cope with it (Biesecker & Erby, 2008) and in order to survive; organisms are able to adapt psychologically to fit with the changed circumstances (Schmitt & Pilchner, 2004). Describing research findings in the field of positive psychology, Matthew (2008) points out that, in extreme situations or in times of



enhanced mortality, salience and positive reactions may appear instead of fear and anxiety. The issue of resilience (Bartone, 2006; Bartone, Roland, Picano & Williams, 2008) is closely related with looking for potentially positive outcomes of being exposed to extreme situations. Our results confirm that there are changes, observable in individuals self-perceived personality characteristics reflecting environmental demands. This finding has been supported also by neurobiological changes (Van Wingen, Geuze, Vermetten & Fernandez, 2010). However, we go further than these authors proposing that these behavioural changes could be viewed also as *effective trait expressions* or as *states* suggesting characteristic adaptations with certain environmental demands which are by definition temporal and should not be mixed up with psychological growth as suggested by Matthew (2008).

*New insights in 'scientific white land' Estonia* Our research can be considered as a milestone study for the Estonian military, and according to available information, for the armed forces of all Baltic countries. This study is the first in Estonia, and to our knowledge in the Baltic States, to explore personality in relation with task environment in the military, offering descriptive data on this population. A better understanding of the fit between person and environment based on their need for sensations vs. structure provides valuable information in understanding soldiers' performance in various task environments, and suggestions how to optimize performance in various army jobs based on the needs of contemporary individuals' (NATO RTG-107 Technical Report, Oct 2007, pg 3F-20). The described advantages and disadvantages of the combination of Sensation Seeking and Need for Structure in unpredictable and risky situations, remarkably extend the literature related to soldiers resilience in a military environment. Although the research was implemented with a military sample, our results are well applicable also to the civil population, especially to those who are working in unstable and unpredictable environments (e.g. police or rescue services). Extending the use of these adapted measures in this geographical region, helps to explore the issue of person-environment fit (more indirectly the possible implications of poor fit) in the workplace in different organisational settings.

### 5.2.2. *Practical implications*

From a practical point of view, the dissertation contributes to the everlasting consideration in the military to maximize the effectiveness of the performing human element. The findings reported in this doctoral research have a range of practical implications. Our studies provide evidence-based knowledge for two things that can be – for not saying need to be – improved: preparation before and rehabilitation after a mission. First, to increase soldiers' psychological resilience in severely restricted deployment environments compared to their home garrison, training should not only point on risks and threats, but also on coping with tight regulations, routine tasks and boredom. For now, the impact of the proclaimed personality profile leading to a particular self-selected population is even more amplified by action-oriented training which prepares them well for threats and risks but not for an increased level of restrictions. It might be useful to consider extra modules for those specific profile groups who have proven to be the least fit for a specific deployment context. Second, support structures responsible for helping soldiers to get fit again for civil society after deployment, may use our findings by developing target-oriented rehabilitation programs to provide effective services to those for whom it is most needed and profitable for the organisation; i.c. the EDF. In addition, to be more effective in terms of increasing mental persistence in their units, military leaders may benefit from an individual-based approach across the whole deployment cycle.

*Improving Preparation Programs* An emergent behaviour of a military performer is a reaction to the current environmental event and is influenced by the soldier's person (*nature* factor) but also by his acquired competencies and previous experiences (*nurture* factor). Realistic training is said to be a main concern of today's militaries. Results presented in this dissertation suggest that, to increase soldiers' mental resilience, applying a more individual-based approach in their pre-deployment training (but also in basic training) is beneficial. This is well in line with Rademaker's (2009) recommendation to adopt tailored training and coaching programs instead of the classic one-size-fit-all approach. It is known that psychologically experienced stressors can result in remarkably impaired performance. Taking into account that stress is often in the mind of stressed

(Krueger, 2008) it is useful to increase training effectiveness by creating individual-based and software-based training models which are intelligent enough to take the performers' psychological profile into account. Technology-based training, especially interactive simulation, is proposed as a powerful learning environment because it produces not only more but especially better learning (Graesser & King, 2008). Ideally, the created software should be capable to take into account as many as possible of the agent's personal characteristics (e.g. personality, experience, type of training needed) and this at a sufficient level of detail. Several micro-level formal models able to deal with the cognitive-affective state (see, Zacharias, MacMillan Van Hemel, 2010), the situational assessment (Lewis, Buford & Jakobson, 2009), or to manipulate unpredictable environmental variables (Shvartsman, Taveter, Meriste & Parmak, 2011) are already developed and can serve as platforms.

*Improving Rehabilitation Programs* In line with findings that personality is related with the psychological vulnerability for a traumatogenic event (Rademaker, 2009), our findings recommend that the post-deployment screening for psychological victims and the treatment provided should take those aspects of personality into account that make the particular person more vulnerable for exposed demands in this specific deployment. Our results suggest that a personality-based approach in rehabilitative programs could be a beneficial and a cost-effective way also for not traumatized soldiers' in their re-adaptation process. Armed Forces from several countries already make use of specific psycho-education programs and activities for soldiers returning from intense missions to assist them to re-adapt back to the social norms of the home country and to the work routines in garrison. As an example, there is the Third Location Decompression program designed to allow to the service personnel returning from deployment to adapt to the home environment in a graduated way, with the aim of reducing the potential for maladaptive psychological adjustment (Hacker Hughes et al., 2008; Castro, Greenberg & Vigneulle, 2009). Also the Army Warrior Adventure Quest program must be cited here (see <http://www.hood.army.mil/resiliencycampus/Warrior.aspx>), developed by the U.S. Armed Forces to help soldiers to re-adjust after the deployment. Our results provide an additional scientific justification for those practices but also recommend the potential use

of a personality-based approach as intervention model. It could be one step ahead towards more sophisticated re-adaptation programs. Theoretically, targeted programs for rehabilitation and training that are able to take into account individual needs are more time- as well as cost-effective than those applying a universal approach. The effectiveness, of course, must be empirically demonstrated before application.

#### *Directions for Further Research*

The results of the studies reported in this dissertation contribute to the understanding of the interactive mechanism(s) between personality predispositions and demands of a particular task environment with respect to the psychological resilience of the performer. To extend the use of the adapted instruments of Sensation Seeking and Need for Structure (Chapter 2, Study I) beyond Estonian military population, investigating their role as a determinant of self perception, of perception of the situation and of behaviour and consequently of well-being (at work) in different sub-populations would be a useful way ahead. Also, studies to explore further the issue of person-environment fit in the workplace related to the qualities determining the structure of the employees' environment (Chapter 2, Study II) may have benefits for the performance in the military as well as for civil organisations.

One limitation of our research about situational adaptation (Chapter 3) was that it did not involve the lastingness of the adaptation effect. If the change in behaviour is a consequence of situational adaptation, sooner or later, an individual will adapt back to his normal environment. Although the change is expected to reverse back to baseline as a result of "habituation of dishabituation" (Thompson & Spencer, 1966), it has to be examined in further research, preferable in neurobiological terms for the sake of objectivity (Rademaker, 2009). Recent developments in this field are encouraging (see, Van Wingen, Geuze, Vermetten & Fernandez, 2010) providing a valuable addition to research where self-report measures are used. In order of being able to enhance soldiers' situational adaptation in deployment as well as their re-adaptation once back home; the mechanism of adaptation is worth to be studied more in detail, especially the role of training and of leadership in that process.

In following studies about the P x E fit, the focus should not only be on psychological well-being (Chapter 4) but also on emergent behaviour or misbehaviour and performance in garrison and in deployment. Examining the influence of Sensation Seeking and Need for Structure on the behaviour and performance in a military task environment can provide useful information regarding how to optimize the outcome(s) in various professional roles based on the individuals' personality-based needs.

*The Way Further: A Mental Persistence Model*

Duckworth, Peterson, Mathews and Kelly (2007) have suggested that the achievement of difficult goals entails not only talent but also the sustained and focused application of talent over time. In the same vein it is noted that while mental and physical achievement and ability are proven to be important predictors of military performance, the probability of success increases when a high level of performance is sustained over time and under increasingly difficult conditions; that is, when soldiers persevere (Beal, 2010). Explaining the motivational sources of human behaviour involves clarifying the determinants and intervening mechanisms that govern the activation and sustained direction of behaviour (Bandura, 1989, 1991). Mental persistence, hence, can be observed in terms of one's willingness or a motivational urge to intensify his effort and persistence of exertion in this particular environment. Although it is found that persistence provides a unique contribution in success outcomes (Beal, 2010; Duckworth et al., 2007), little has been done to establish an empirical basis of the potential mechanism of this phenomenon. The underlying idea of which, however, is mentioned with increased frequency as an important aspect of personnel selection.

Exploring mental persistence from the focus of Person x Environment fit in a military framework can be defined as the willingness to endure the experience of operational deployment and the readiness to grow as a result of the perceived fit between their perceived personality and perceived operational environment. A person, who perceives his environment as fitting is willing to endure, adapts to the situational demands and feels motivated. On the contrary, a person, who perceives the environment as not fitting with his needs, is not motivated to invest his energy to grow through situational demands.

From that perspective the research question for further studies could be formulated as: *what is the mechanism of mental persistence in a particular task environment and is there something that could be done about it?* Particularly, based on the results presented in the current dissertation one could ask: *what is the role of personality as a contributing factor to the mental persistence in a particular task environment?*

Integrating our results into one meaningful whole for further studies, a Mental Persistence Model is proposed in Figure 5.1

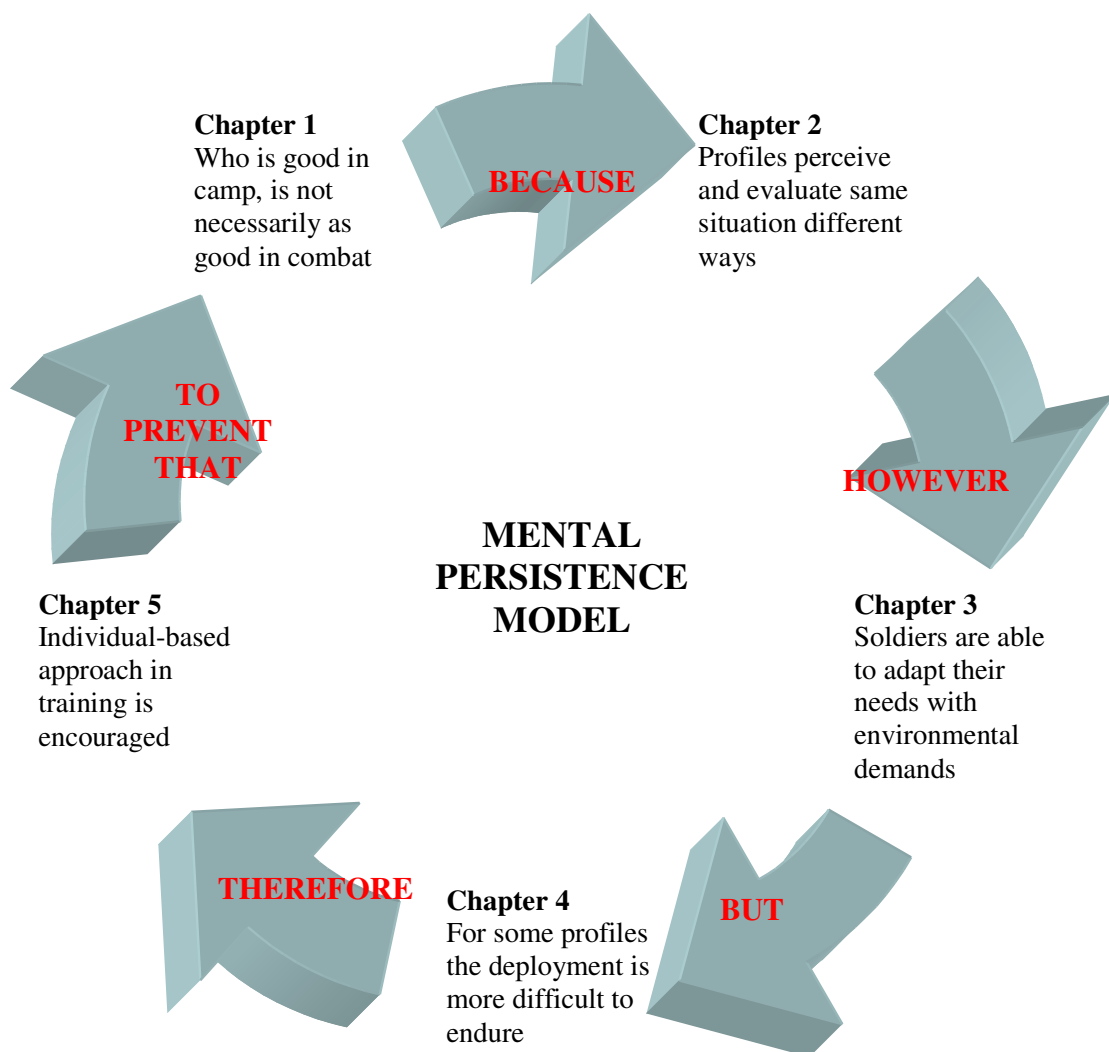


Figure 5.1 *Mental Persistence Model (proposed)*

The Mental Persistence Model, if further explored, could provide a solid theoretical framework to the incremental observations through military history that “*The military is composed of two fundamentally different types of individuals, each with unique advantages and weaknesses*”, formulated strikingly by Major Michael Russell (2000).

*To conclude*

A performance can be superior only, if the performing individual is in a good working condition as well as able and willing to perform at best the requested action. The argument does not apply to military and paramilitary institutions only, but also to civil enterprises and governmental bodies. In short, it applies to all establishments where the human element as a performer is involved. However, in this dissertation we have been focusing on the military environment in general and the operational one in particular; as a consequence, our results are discussed more in terms of military implications.

Unexpected reactions of the performing human element have a great potential to jeopardise any military operation. Ignoring risks caused by the service member behaving in an unpredictable way can undermine severely any operational success. In the military, it is common to presume that soldiers give always the best of themselves – following their training and field manuals. However, a human agent does not operate autonomously but within an interactional causal structure (Bandura, 1989) and all elements present in his environment have the potential to interfere with the process at any time but especially in the times of stress (Hancock & Szalma, 2008). Understanding the interaction between situational demands and personality-based aspects is necessary in order to prevent dangerously oversimplified predictions. Taking everything together, the main message of the dissertation in practical terms is that we need to give up to built our expectations about human performance only in technical terms using a “stimulus – (trained) reaction” line of thinking; i.e. relying merely on a behaviouristic approach. Our results presented in this dissertation encourage taking into account the interactional nature of relations between a person and his environment in predicting any human outcome.

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