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**Sensation seeking and perceived need for structure moderate soldiers' well-being
before and after operational deployment**

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Abstract

The study examined associations between sensation seeking and perceived need for structure, and changes in reported well-being among deployed soldiers. Participants (n=167) were assessed before and after a six-month deployment to South-Afghanistan. Results indicated that although well-being declined in the soldiers' sample as a whole following deployment, the degree of decrease was significantly different among soldiers with different personality profiles. Differences were moderated by soldiers' level of sensation seeking and perceived need for structure. Results are discussed in terms of a person-environment fit theory in the context of preparation and rehabilitation of deployed military personnel.

Circumstances that are perceived as stressful by one type of person can be experienced differently and even comfortably by another type (Adler, Brett & Bartone, 2003). Jobs can be experienced as eustress by the person (Nelson & Cooper, 2005) even in extremely distressful situations. To understand individual responses to potentially stressful events, situational as well as personality variables are to be considered (Krueger, 2008) because for each individual there are environments which positively relate the characteristics of his personality with his performance and satisfaction (Pervin, 1968; Schneider 1978; Holland 1996; Roberts

& Foti, 1998; Greenberg, 2002; Lyons & O'Brien, 2006, DeRue & Morgeson, 2007). Although a continuous tradition of person-environment fit research has proven its usefulness in civil settings (Lewin, 1935; Cronbach, 1957; Pervin 1968; Barrick & Mount, 1993; Beaty, Cleveland & Murphy, 2001), this approach has not had significant emphasis in the military. Acknowledging the role of the interaction between situational demands and personality predispositions, or person-environment fit, may prevent dangerously oversimplified predictions since unexpected reactions of the performing human element have a great potential to jeopardise any military operation.

For the foundation of our research, we rely on the extended person-environment fit theory proposed by Quick, Nelson, Quick and Orman (2001). They use the concept of isomorphism and define it as the one-for-one fit between specific, corresponding dimensions in the person and environment. For an indicator of the person-environment fit, we focus on the state of well-being (Feist, Bodner, Jacobs, Miles & Tan, 1995), which is related to the person's appraisal of a specific environment as disturbing or challenging (Priest, 1992; Ewert & Hollenhorst, 1989; Hanton, Evans & Neil, 2003). A complete practice of psychology should include an understanding of both suffering and happiness (Seligman, Steen, Park & Peterson, 2005) and the state of well-being is found to be an important factor for a healthy life and productive work performance (see for example: Boehm, 2008; Edwards & Cooper, 1988; Ilies, Schwind & Heller, 2007; Koopmans, Geleijnse, Zitman & Giltay, 2010; Lyubomirsky & Boehm, 2010; Wood & Stephen, 2010; Wright & Cropanzano, 2000). Still, a search for relevant Subject Terms in a scientific

database (EBSCO)¹ revealed only 5008 hits about well-being, nearly 20 times less than the number of studies conducted about stress (99044 hits), for instance. Limiting the search with the word “military”, the outcome revealed a nearly 30 times difference. The number of hits concerning studies conducted about stress and military was 284; about well-being and military there were only 10.

Environmental controversies in military operations

The deployment environment can be characterized by elevated risks and unpredictable incidents, but also by a lot of predicted rules to comply with, highly scheduled daily life, and boring camp-duties. Being simultaneously present, these paradoxical conditions – chaos and order -- constitute a challenge for the soldiers’ psychological adaptability. Soldiers, especially those in lower ranks, deployed to international operations do not have any opportunity to control the intensity of events nor to choose and organize their activities according to their preferences. While deployed, they are rather forced to adjust to the increased level of risk but also to more strict regulations to “survive”. For those whose personality profile is less fitting with the deployment reality, psychological resilience is harder to maintain. Routine tasks in a secure environment, which are irritating for one soldier, may match perfectly with the preferences of his colleague. Significant relations have been reported between soldiers’ personality dimensions and their perception of situation structure, characterized by predictability and riskiness of the situation (Parmak, Mylle & Euwema, 2013). Based on this finding, the assumption could be made that a soldier who is happy in predictable and regular duties can be stressed out even if he only thinks of risky and dangerous tasks, whereas others may want to seek

¹ Note: the research was conducted on 31.03.11

adventure and risk outside the compound. In this study, we explore the relationship between two personality characteristics that relate directly to the two elements of the challenges of complex military task environments: the uncertainty and high risk might be related with Sensation Seeking (SS), whereas the strict regulations and often highly standardised tasks might be related with Need for Structure (NS).

Sensation Seeking and Need for Structure

Sensation Seeking (SS) 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 (NS) prefer clear and predictable situations over complicated and indefinite ones (Neuberg & Newsome, 1993). They tend to enjoy simple, tightly organized environments and try to manage their lives in an orderly fashion (Schaller, Boyd, Yohannes & O'Brien, 1995; Gordon, 1997). 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 become life-threatening (Van den Berg & Soeters, 2009).

Hypotheses

Considering the demands of combat deployment, this environment is not the easiest place to idle away time (Bartone, 2005). It is an emotionally and physically exhausting experience, as reflected afterwards in increased symptoms of common mental disorders and alcohol misuse (Fear et al., 2010). Deployed soldiers differ according to their coping resources. Nevertheless, one way or another, a long period in a risky and restricted environment is demanding for all of them. While acknowledging potentially rewarding aspects in deployments such as professional challenge or a feeling of belonging, in our research we expect that (H1) the level of well-being in general is lower after the deployment (Time 2) compared with its level assessed on pre-deployment (Time 1).

Generally, military training is about preparation for action and about how to handle threats, and not about how to sustain boredom, routines or how to cope with an increased level of restrictions. We hypothesise that (H2), during deployment, psychological well-being decreases more significantly among soldiers who are low in need for structure, irrespective of their sensation seeking propensity. In other words, we expect to find an interaction effect between the categories of NS on well-being before (Time 1) and after (Time 2) the deployment.

Soldiers are normally able to adapt according to environmental demands (Parmak, Euwema & Mylle, 2011). However, for some profiles it can be more challenging than for others to do so. In our research we assume (H3) that, for particular combinations of profiles, groups do better (i.e. less decrease in well-being) than some other groups. An interaction effect is expected between the categories of NS and SS on well-being at Time 1 and Time 2.

To mitigate the impact of uncontrollable environmental issues related to particular features of a single deployment (e.g. leadership, objectives, and incidents), our research encompasses longitudinal data from three 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.

Method

Participants and procedure

Taking the small size of deployed units into account, the sample for this study consisted of 3 rotations of professional soldiers² deployed from 2007 to 2009 for a 6-month tour-of-duty to Afghanistan. Our final sample included 167 soldiers in total ($n = 67$, $n = 47$, $n = 53$, for the first, second and third rotation respectively). Only participants whose pre- and post-deployment data were available were included in the analysis. The age of the subjects ranged from 18 to 45 years ($M = 25.3$, $SD = 4.7$), and they reported between 9 and 18 years of education ($M = 12.3$, $SD = 1.8$). Participants' previous deployment experiences ranged from 0 ($n = 86$) to 6 ($n = 1$) deployments³. For all three rotations, the baseline data (Time 1) were collected two months before departing for deployment, during the pre-deployment training. The second measurement (Time 2) took place within two days after the unit arrived from Afghanistan back to Estonia, before soldiers left for their holidays. Soldiers' participation in this study was voluntary.

² Conscripts are not deployed to international operations in Estonia.

³ For Estonian troops regular deployments last for 6 months.

Measures

In our study, the *Sensation Seeking Scale V* (SSS-V, Zuckerman, 1978; 2005) was used for the assessment of sensation seeking as a trait (SS). 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 found to be valid (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, 2013).

The *Personal Need for Structure* inventory (PNS, Thompson, Naccarato & Parker, 2001; Neuberg & Newsome, 1993) assesses the degree to which a person prefers a simple structure, organization and clarity. The instrument is found to be valid in civil (Meiser & Machunsky, 2008) as well as military Estonian populations (Parmak, Mylle & Euwema, 2013) 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. The item 5 was dropped because of conceptual and empirical reasons reported in the original research paper (see Neuberg & Newsom, 1993). The total score represents different aspects of structure seeking; higher scores on the PNS indicate a higher structure seeking 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 measures not only the absence of symptoms but also the level of well-being (Bech, Olsen, Kjoller & Rasmussen, 2003). Internal consistency (Cronbach’s α) was acceptable in our study ($\alpha = .83$). The “WHO-5” results were stable across both testing periods ($r = .44, p < .001$), showing a satisfactory test-retest reliability.

Results

Descriptive statistics of the studied variables and their inter-correlations are presented in Table 1.

- Insert Table 1 about here -

The presumed decrease in the general level of soldiers’ well-being was observed: 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 finding 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 at Time 1 ($R^2 = .040$, *n.s.*) or at Time 2 ($R^2 = .026$, *n.s.*).

To assess if and how the observed decrease in well-being can be related to personality predispositions, we coded all participants according to the frequency tables of their scores into nine profile groups, with a more or less equal number of respondents, combining: low need for sensations (LSS, $n = 60$; $M = 14.2$, $SD = 3.0$), moderate need for sensations (MSS, $n = 53$; $M = 19.6$, $SD = 1.1$), and 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, $n = 61$; $M = 27.4$, $SD = 1.1$), and high need for structure (HNS, $n = 54$; $M = 31.9$, $SD = 2.2$). Reflecting the negative correlation between SS and NS, 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 2 presents the descriptive statistics (means and standard deviations) of the independent (profile groups) and dependent (well-being at Time 1 and Time 2) variables in each of the nine profile groups.

- Insert Table 2 about here -

Differences in soldiers' well-being between low, moderate and high groups are not significant for Sensation Seeking (Wilks $\lambda = 1.00$, $F(4, 316) = 0.81$, $p > .05$) nor for Need for Structure (Wilks $\lambda = .95$, $F(4, 316) = 1.99$, $p > .05$) when groups are explored separately.

To illustrate the dynamics of change, Figure 1 presents well-being levels at Time 1 and Time 2 among SS (Figure 1a) and NS groups (Figure 1b).

- Insert Figure 1 about here -

An ANOVA with a 3 x 3 x 2 factorial design revealed a significant interaction effect (Wilks $\lambda = .91$, $F(8, 316) = 2.00$, $p < .05$) between the combination of profile groups (NS/SS) and soldiers' well-being before (Time 1) and after (Time 2) deployment, supporting our second hypothesis (H2). Figure 2 illustrates the design with 3 (SS: low, moderate and high) by 3 (NS: low, moderate and high) by 2 (Time 1, Time 2) conditions.

- Insert Figure 2 about here -

Figure 2 (a) shows that low structure seekers (LNS) felt themselves better than other profile groups at Time 1. However, in accordance with H2, their well-being after deployment (Time 2) also dropped more than other profile groups. Compared to the LNS profile, soldiers who are moderate in their structure seeking (MNS) did reasonably well (Figure 2b) at all sensation seeking levels. The decrease in well-being at Time 2, 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 2c). For this profile (except in combination with low SS) changes in well-being were null; i.e. they came back at the same level of well-being as the one they left with.

Providing support to our third hypothesis (H3), an interaction effect was found between the SS profiles, NS profiles and Time. The decrease at Time 2 compared with Time 1 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 did not change at all (HNS/HSS) or even showed a slight increase (HNS/MSS). Still, although not statistically significant, well-being went down for one group of HNS soldiers, namely for those high in structure seeking combined with low sensation seeking (HNS/LSS).

Discussion

In accordance with statements about individual differences in perceived stress (see for example: Adler, Brett & Bartone, 2003; Hancock & Szalma, 2008; Nelson & Cooper, 2005) our findings suggest that emphasising only risks and threats as main stressors in combat deployment may be oversimplified. Most of the service members who were well at the beginning of service were those who do not like their environment too structured or regulated. Most of the service members who were well at the beginning of service were those who did not like their environment were too structured or regulated. However, their level of feeling well 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 do not do well in chaotic and risky environments. According to research, this makes sense: Conscientiousness and Neuroticism are personality characteristics that distinguish

professional soldiers and conscripts who represent the general population (Parmak, Mylle & Konstabel, *under review*). In the Five Factor Model (FFM), Conscientiousness is negatively correlated with Sensation Seeking (Zuckerman, 1978; Parmak, Mylle & Euwema, 2013), while Neuroticism, correlates positively with NS (Neuberg & Newsome, 1993; Parmak, Mylle & Euwema, 2013). Soldiers high on both traits (HNS/HSS) confronted with the contradictive demands of the military operational environment - i.e. looking for intense sensations but also for tight regulations - did not function well either in garrison or during deployment. A number of people's goals and desires may be in conflict, and thus it is impossible to satisfy them both fully (Diener, 1984). Also, soldiers who were moderate in both traits (MNS/MSS) felt worse than other profiles before the deployment as well as after. 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 do like well-ordered environments. For them, changes in well-being were null; they came back at the same level of well-being as the one they left with (if they had at least a moderate need for sensations).

Altogether our research goes along with models where personal factors are considered as resources to meet occupational demands, such as the Military Demand-Resource model (Bates et al., 2010) and the Occupational Mental Health model (Adler & Castro, 2013). Despite some unfortunate limitations described below, our results contribute to a comprehensive framework of psychological fitness for the Armed Forces. Our research, if repeated with a larger sample, may have two potential uses. First, personal resources should be activated by relevant training. To increase soldiers' mental stamina in severely restricted deployment environments compared to their home garrison,

training should not only focus on risks and threats, but also on coping with tight regulations, routine tasks and boredom. For now, the predisposed personality profile in a 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 restriction. In some cases, it might even be useful to consider extra training modules for specific profile groups who have proven to be the least fit for a specific deployment context. Second, support structures responsible for helping soldiers to become fit again for civil society may consider our findings there, where they are most needed. For now, post-deployment support programs or other interventions may feel overly thorough for some troops but insufficient to others. In addition, it seems that to be more effective with managing the mental stamina at the unit level, military leadership may benefit from an individually focused approach across the whole deployment cycle, rather than a classic “one size fits all” approach.

Individual differences in personality are the source of behavioural variation, especially in times of stress, and these differences are neither fully reduced nor reducible through drill and expertise (Hancock & Szalma, 2008). Our results support the person-environment fit theory proposed by Quick, Nelson, Quick and Orman (2001), provide hints at how to benefit from acknowledging an interaction effect between the individual and his task-environment, and suggest a more individualized approach to human resources management in Armed Forces.

Limitations

The small sample sets some considerable limitations to our study. First, we were not able to monitor an interesting process, i.e. the dynamics of personality (NS and SS), within rotations because this would require us to divide our sample in 27 sub-groups by adding a time variable (before, during and after deployment), leaving us an average of 6 participants in a group. One could expect that individual differences in sensation and structure seeking will positively influence soldiers' psychological persistence in deployment environments or duties which correspond to their personality characteristics. Research with a larger sample should be conducted to explore how individuals with a particular personality profile are coping with different service duties. Another limitation is potential bias. In our sample, we aggregated data from three rotations of deployed troops. In spite of the fact that all rotations were deployed exactly to the same area of South-Afghanistan, their environment (including operational assignments) still could have been different in aspects we were not aware of. A third limitation to mention is the timing of the second data collection. Two days after returning home is not representative for the whole post deployment period; rather, it only reflects the moment of home-coming. A third wave of data collected some three months after the home-coming could be useful to evaluate if and for how long detected differences in troops' well-being are observable.

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Table 1.

Descriptive statistics and inter-correlations of the variables studied (n = 168).

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

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

p< .001

Table 2

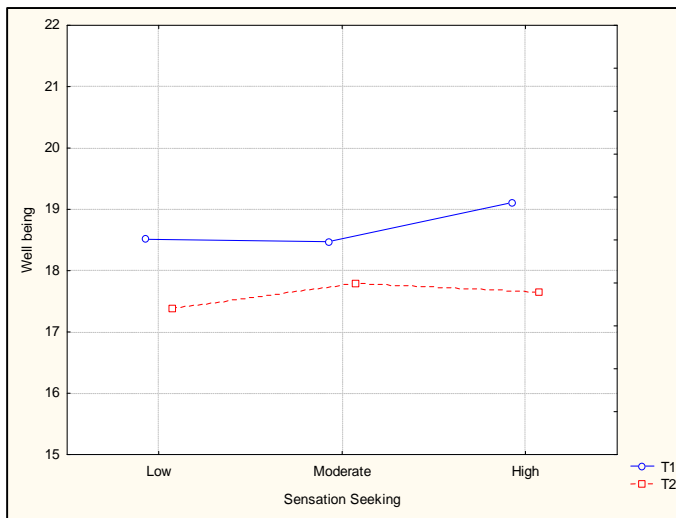
Descriptive statistics level of Well-Being at T1 and T2 in SS/ NS profile groups

		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

* $p < .05$

(a)



(b)

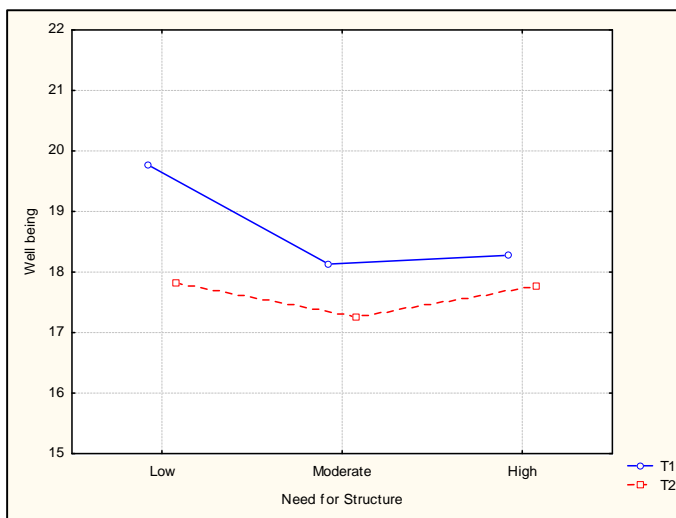


Figure 1

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

Note. SS= sensation seeking, NS= structure seeking; T1= well-being before deployment,

T2= well-being after deployment

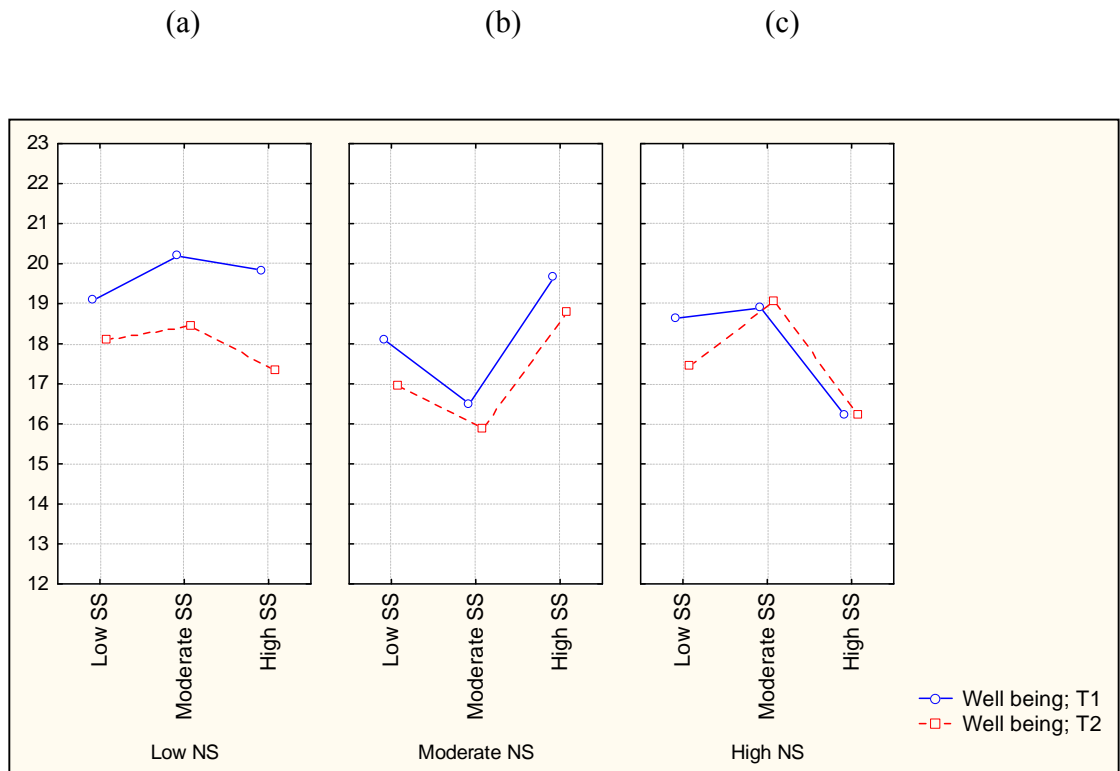


Figure 2

Illustrated dynamics of well-being within profile groups

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