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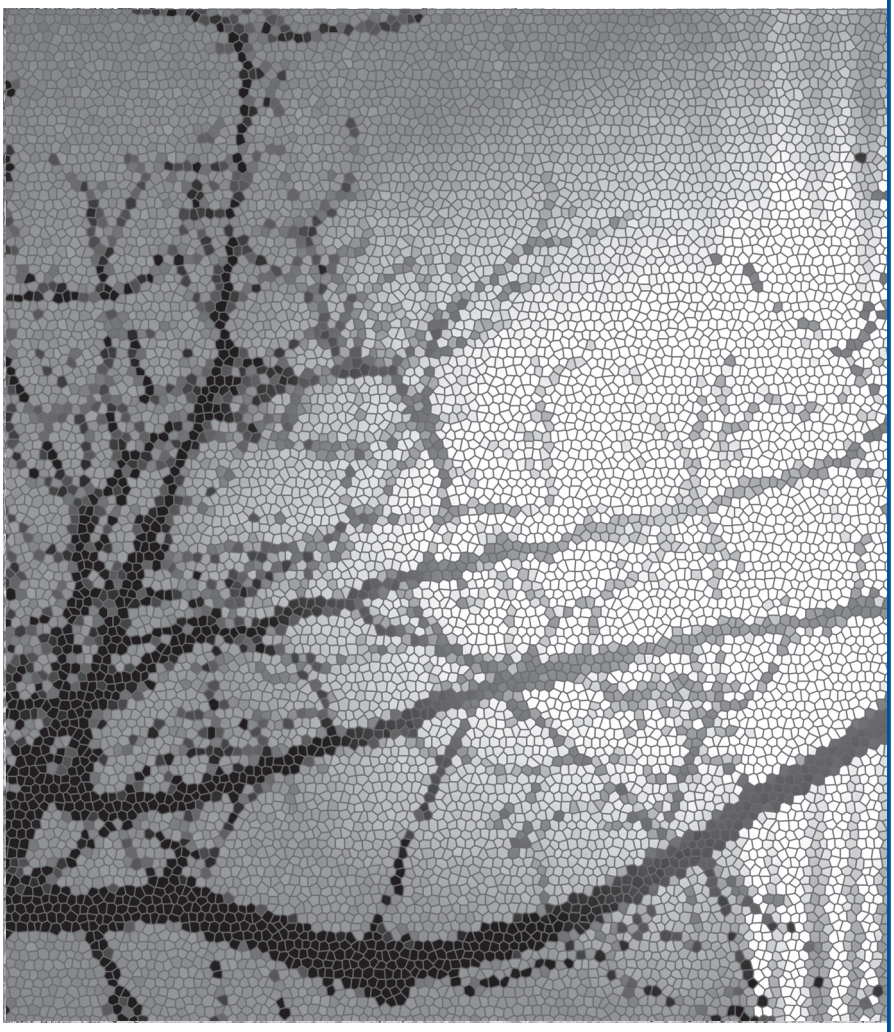

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Psychological climate and its relation to work performance and well-being: The mediating role of Organizational Citizenship Behavior (OCB)

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The main purpose of the present study was to test a model that specified organizational citizenship behavior as a mediator of relationships between psychological climate and work outcomes. In doing so the Swedish version of a measurement of psychological climate was validated using a design that replicated a study by D'Amato and Zijlstra (2008) in the Scandinavian context. Participants (N = 599) were nurses (n = 345) and other health-care personnel (n = 264) at hospitals in Sweden. The area of interest was to investigate correlations between different dimensions of psychological climate and general self-efficacy (GSE), and performance and well-being (conceptualized as low value on a burnout questionnaire). The problem to be explored was to address the role of organizational citizenship behavior (OCB) as mediating variable. Among the measurements was a Swedish version of the Majer_D'Amato Organizational Questionnaire 10 (M_DOQ10) which describes psychological climate on ten factors. Results show that all 10 M_DOQ10 factors correlate negatively with burnout and positively with OCB. The model with OCB as a mediating variable was confirmed regarding well-being but less so regarding performance.

Key words: Psychological Climate, performance, well-being, self-efficacy, organizational citizenship behavior.

Introduction

As the health system turns more and more into organizational systems geared towards efficacy and efficiency of the system, and the achievement of clear organizational goals in terms of standards and performance, to know the organizational environment from the psychological perspective of the workforce is a relevant starting point for an individual´s well-being and productivity at work. A recent report shows that the overall efficiency of Swedish health services is good in comparison to other countries (SALAR, 2005) with regard to productivity. Regretfully, well-being of employees was not assessed in this report. But since populations in Western countries are becoming increasingly older, there is a growing demand for health services, including prevention, medical intervention, and nursing care. Sweden has experienced the greatest challenge because of the largest increase in the percentage of elderly in the population. Due to these challenges, many countries have assessed their future resource needs and the need for change in their health care systems (SALAR, 2005). The importance of having clear knowledge of what

is the appraisal of the organization and of valid tools in these assessments will probably increase in the future. To meet this need of valid tools to detect climate we must know which the most important factors are. The present study tested a model where the relation between psychological climate and output variables are mediated by organizational citizenship behavior.

Psychological climate (PC) refers to how organizational environments are perceived and interpreted by their employees (Brown & Leigh, 1996), or the policies, practices and procedures which are recognized and rewarded in the organization (Schneider, 1990). Climate perceptions are perceived as important determinants of individual behavior because of the mediation between the more objective characteristics within the environment and the individual (Carr, Schmidt, Ford, & DeShon, 2003). In other words, an individual perceives and interprets the environment and this psychological climate is considered to be the individual's perceptions of the environment and the meaning which is assigned to it (Dickson, Resick, & Hanges, 2006). While psychological climate is an individual level measure (Glick, 1985) organizational climate reflect the beliefs of an organization and a shared perception of how the organization functions (Coyle-Shapiro et al., 2004). Thus, the psychological climate can be distinguished from the organizational climate since the psychological climate is based on an individual's appraisal of the work situation, whereas the organizational climate is the shared appraisal of people in a group or team of the work setting of organizational policies, practices, and procedures that are recognized, supported, and rewarded in the organization (see e.g. Zohar & Luria, 2004).

Psychological climate is also the individual employee's perception of the psychological impact of the work environment on his or her own well-being (James & James, 1989). Earlier studies have shown that PC is related to several work-related attitudes (e.g. job satisfaction, organizational commitment) and behaviors (e.g. performance, turnover) (se e.g. Burke, Borucki, & Kaufman, 2002). A healthy psychological climate is positively related to productivity, involvement, commitment and motivation and effort (Thayer, 2008). The main purpose of this study was to examine a model that specified organizational citizenship behavior as a mediator of relationships between psychological climate and work outcomes and to validate the Majer_D'Amato Organizational Questionnaire 10 M_DOQ10 (D'Amato & Majer, 2005) in a different cultural context and to replicate the model proposed by D'Amato and Ziljstra (2008) in this national culture. That is, to test a comprehensive framework where the previously verified construct has a central role to explain organizational outcomes.

Climate research

The climate literature has bloomed from the first pioneering studies (Forehand & Van Haller, 1964; Jones & James, 1979; Schneider, 1990) until the last decade where two streams of literature on the topic have emerged (D'Amato & Ziljstra, 2010; Dawson et al., 2008), one where a strategic perspective is espoused e.g. safety, service delivery, and so on (cf. Schneider, White, & Paul, 1998; Burke, Borucki, & Kaufman, 2002; Schneider, Salvaggio, & Subiras, 2022; Zohar, 1980; Klein, Conn, & Sorra, 2001) as well as general climate studies (Forehand & Von Haller, 1964; Schneider, 1990; Jones & James, 1979; Burke et al., 2002; D'Amato & Ziljstra, 2008).

More recently, Brown and Leigh (1996) focused on two specific dimensions of psychological climate, safety and meaningfulness, to test climate's relationship to job involvement, effort, and performance. They proposed that psychological climate had a direct effect on job involvement and effort, and that effort mediated job involvement's effect on performance. In their study, Brown and Leigh adopted Kahn´s (1990) definition of psychological climate, specifically the dimension of psychological safety, which refers to the freedom employees feel in expressing themselves without negative repercussions in terms of their image or career, and psychological meaningfulness, which refers to the reciprocity employees feel in terms of the returns they receive for the energy they input into their work. The results supported the researcher's hypotheses, with positive psychological climate (specifically the perception of safety and meaningfulness) related to greater job involvement, which in turn was related to higher performance through the mediating effects of effort.

Two groups of researchers conducted separate meta-analytic reviews on climate to illuminate its relationship with individual-level work outcomes. Carr, Schmidt, Ford, and DeShon (2003) examined the relationship between the three higher order facets of climate (i.e., affective, cognitive, and instrumental) as conceived by Ostroff (1993), the mediating nature of job satisfaction and organizational commitment, and the individual-level outcomes of job performance, psychological well-being, and withdrawal. As hypothesized, affective, cognitive, and instrumental climate could account for a substantial amount of variance in individual level work outcomes; cognitive and affective states of job satisfaction and organizational commitment would mediate the effects of climate on individual-level outcomes, and differences were detected in the relationships between the three higher order climate factors, the two mediating variables, and the individual-level outcomes. These results highlight the importance of mediating variables in this line of research but none of the studies tested the mediating effect of organizational citizenship behavior.

In a similar study, Parker et al. (2003) performed a meta-analysis of relationships between climate perceptions and individual-level work outcomes and classified climate according to a model posited by Jones and James (1979), which described four dimensions of climate perceptions: (1) role stress and lack of harmony, (2) job challenge and autonomy, (3) leadership facilitation and support, and (4) work-group cooperation, friendliness, and warmth. A fifth dimension, which was subsequently dropped from James and his colleagues' (1990) model, organizational and subsystem attributes, was also added as a category for the purpose of meta-analysis. Parker et al. examined whether work attitudes (job satisfaction, job involvement, and commitment), psychological well-being, and motivation were affected by climate and whether they mediated the impact of psychological climate on organizational outcomes such as performance. Thus the results of a meta-analysis by Parker and colleagues (2003) supported the relationships between psychological climate and work attitudes, motivation, psychological well-being, and employee performance, with the stronger of the relationships belonging to employee work attitudes and psychological well-being. Parker et al. (2003) also found that work attitudes and motivation fully mediated the impact of psychological climate on employee performance. The climate dimensions of leadership, work group, and organization were strongly related to work attitudes, while the dimensions relating to job characteristics

and leadership were found to have the strongest association with psychological well-being. These results tell us something about the importance of using both performance and well-being as output variables.

One aspect of the relationship between organizational climate and performance that has been recently examined by Bowen and Ostroff (2004) is Human Resource Management (HRM) strength. Bowen and Ostroff argue that a strong organizational climate mediates the relationship between a strong HRM system and organizational performance. They conclude that strong HRM systems foster the development of an organizational climate from individual psychological climates, due to decreased variability in individual employee's perceptions and behaviors. A stronger organizational climate, in turn, contributes to performance by eliciting behaviors that are consistent with the organization's goals.

Differences in perception of psychological climate are generally attributed to individual differences among employees (Brown & Leigh, 1996). Biases, variations in interactions between individuals and situations, and other factors may result in different perceptions of the same climate.

Kahn (1990) analyzed the conditions of reported moments of engagement and found three generalized psychological conditions. Prior to psychological engagement, the individuals first assess the level of meaningfulness; the level of safety; and finally, the level of psychological availability. In other words, the employees will first determine whether the work or the outcome is personally meaningful or if they even care about the outcome.

Perceived meaningfulness of contribution is the perception that the work is affecting the organization's processes and outcomes and those they, the employees, are helping the organization to meet its goals. Organizational recognition and support aids in the creation of a psychologically meaningful climate.

Strong climates, high degree of shared values and/or agreement among practices or policies, often reflect less ambiguity and result in clearer expectations and an increase in consistent behaviors because employees have a similar understanding of the norms and practices of the organization (Dickson et al., 2006). Schneider, Salvaggio and Subirats (2002) tested the hypothesis that climate strength moderates the relationships between employee perceptions of service climate and customer satisfaction which was partly supported.

Thayer (2008) examined the relationship among psychological climate, employee engagement, and organizational citizenship. While psychological climate correlated with both employee engagement and organizational citizenship, there was no significant relationship between organizational citizenship and employee engagement.

Across the literature, two research traditions can be distinguished, the organizational climate (shared perception) approach and the psychological climate (cognitive schema) approach. One tradition is based on models that emphasize aggregation of individual data. This, the organizational climate approach, is the most common research tradition and it emphasizes the importance of shared perceptions as underpinning the notion of climate (Anderson & West, 1998; Mathisen & Einarsen 2004). Reichers and Schneider (1990) define organizational climate as "the shared perception of the way things are

around here" (p. 22). A different tradition, the psychological climate approach, emphasizes models that stress the role of the individual and the perceptual level in the work process. That is, it regards the concept of climate as an individual perception and cognitive representation of the work environment. From this perspective climate assessments should be conducted at an individual level. This means that individual characteristics of employees and the notion of cognitive regulation are central to the models. D'Amato and Zijlstra (2008) tested a model of the joint psychological effect of individual- and organizational-based variables on the results for both the person and his/her working environment.

This was also the aim of the present study, to examine the influence of psychological climate on work performance and work related well-being, and exploring the mediating effect of Organizational Citizenship behavior (OCB). That is, in the present study it is hypothesized that work behavior mediates the relationship between contextual and individual aspects and the consequences of that behavior. In this research we will focus on the individual level rather than the organizational level. Thus, the context is represented by the job incumbent's perceptions of his/her work environment; this is usually referred to as psychological climate. Besides testing the model, the present study also take one step toward the cross-cultural validation of the model.

Self-efficacy

"Self-efficacy" is a set of preferences, values, and beliefs about oneself in relation to their environment (Bandura, 1977). Self-efficacy beliefs have been described as cognitive structures about people's appraisal of their capacity to master specific domains of actions, for example, the capacity to deal successfully with opportunities and challenges that are associated with the work role (Caprara et al., 2003). A worker's self-efficacy is an important determinant of work behavior, because self-efficacy beliefs engender engagement in the work task, and stimulate people to do their best to perform at a high level, which is likely to be reflected in their work behavior.

In an organization, not all individuals automatically give the same importance to all the rules and procedures, so there are likely to be differences in interpretation. Additionally, these rules and procedures will not affect all individuals' behavior in the same way. For example, when an individual has a rather low level of self-efficacy, she or he is much more likely to follow the rules strictly than employees with higher levels of self-efficacy or experience. Self-belief does not necessarily ensure success, but self-disbelief assuredly spawns failure (Bandura, 1997, p. 77). People who hold a low view of themselves will credit their achievements to external factors, rather than to their own capabilities (Bandura, 1997, p. 402). People who regard themselves as highly efficacious act, think, and feel differently from those who perceive themselves as inefficacious. They produce their own future, rather than simply foretell it (Bandura, 1997, p. 395).

Thus, work-related individual characteristics might lead to differences in work behavior, in particular when workers have some discretion with respect to how to use their skills and knowledge, and thus can also cause differences in terms of outcomes.

Judge and Bono (2001) showed that self-efficacy made a significant and substantial contribution to performance. A person's level of self-efficacy will influence the appraisal of the situation, the rules, and procedures that are applicable, and therefore will affect the

decisions the person will make at work. Self-efficacy, together with the appraisal of the environment, determines how an employee will behave in the work situation.

Organizational Citizenship Behavior

When people can identify themselves with, and commit to the group, they are more inclined to accept the norms and values of that group, and are more likely to comply with the rules of the group (Salancik & Pfeffer, 1977). Also, the more people agree with the objectives and rules of the organization and believe that these are congruent with their potential, the more they will comply with those rules and procedures, and act accordingly. This means that they will choose those behavioral options that are in line with the goals of the organization. For this reason, the concept of Organizational Citizenship Behavior (OCB) was introduced (Koys, 2001; Organ, 1988). This concept refers to what extent people comply with what the organization expects them to do (and more). This concept was regarded as a substitute for work behavior in the study conducted by D'Amato and Zilstra (2008), which also was the design of the present study.

Outcomes of work behavior

Models on organizational climate usually focus on the relationship between climate and outcomes at an aggregate level, either team or organization (Burke, Borucki, & Hurley, 1992; Schneider et al., 1998).

Work behavior will result in various outcomes such as the individual's performance, with performance being a direct result of the individual's activities at work. However, generally there are also other outcomes of being active, such as physical or psychological fatigue, and so on. These are primarily relevant for the individual and may affect his or her well-being.

Well-being appears to be largely dependent on work-related factors, and to assess the impact of work on well-being, researchers mostly look at the negative impact of work on well-being, or rather the lack of well-being. A feeling of burnout is frequently used as an indicator of reduced well-being (Wright & Cropanzano, 2000). Burnout is the other face of people's wellbeing Furthermore, in the health sector/industry burnout is recognised as one of the most common symptoms of lack of wellbeing at work, sometimes even used as a measure of stress at work, other times as the outcome of a stressful work environment.

The research model

The research model suggests that PC and GSE are related to work outcomes (performance and well-being) mainly via the degree to which people can commit to the group or organization to which they belong (OCB).

It is hypothesized that the process in which work activities result in a certain degree of performance and well-being is affected by cognitive regulation mechanisms such as self-efficacy. Since work behavior here is operationalized as OCB, the present research aimed to examine the perceptions of psychological work climate and work outcome (performance and well-being) with work behavior (OCB) as the central constructs, psychological climate (PC) and cognitive regulation (GSE) being the independent variables.

Method

Participants

The participants (N = 599) were nurses (n = 224), assistant nurses (n = 93), physicians (n = 42) and other health-care personnel (n = 126). The sample consisted of 507 women (age M = 47.6, SD = 10.01) and 92 men (age M = 45.6, SD = 11.1).

Measures

The central constructs measured through the survey were: psychological climate, general self-efficacy, OCB, performance, and burnout. The alpha values below refer to the Swedish versions of the instruments. The English version of M_DOQ10 was translated to Swedish by the first author and back-translated.

Psychological climate. A Swedish version of the M_DOQ10 (D´Amato & Majer, 2005) was used to measure psychological climate. This instrument has been specifically developed for climate analysis and has been validated by D'Amato and Majer (see e.g. D´Amato & Ziljstra, 2008).

The M_DOQ10 consists of 10 scales: Communication (12) items; example item: "In my organization everybody is adequately informed about the objectives and outcomes"; Cronbach's alpha .76); Autonomy (6 items; example: "In my job I have a certain amount of autonomy"; Cronbach's alpha .83); Team Cohesion/intra-team (11 items; example: "In my team people usually agree with each other"; Cronbach's alpha .90); Inter-team (5 items; example: "In my organization colleagues from different teams help each other"; Cronbach's alpha .88); Job Description (5 items; example: "The tasks that are part of my role are clearly defined"; Cronbach's alpha .73); Job Involvement (5 items; example: "My job is thrilling/ exciting"; Cronbach's alpha .63); Dynamism/Development (5 items; example: "In my organization the decisions that are taken are implemented quickly"; Cronbach's alpha .63); Reward Orientation (5 items; example: "Financial incentives are adequate when rewarding commitment and skills"; Cronbach's alpha .70); Supervision/leadership (8 items, example: "My supervisor is sensitive to my training needs"; Cronbach's alpha .89); Innovativeness (5 items, example: "In my organization people are encouraged to find new ways around old problems"; Cronbach's alpha .90); and Corporate Responsibility (8) items, example: "My organization makes an effort to adapt to social and political changes"; Cronbach's alpha .83).

These ten dimensions are aggregated to form three foundation issues, organizational policies, job procedures and managerial practices.

General self-efficacy (GSE). GSE was assessed by a 10-item scale developed and validated by Schwarzer (1993) (example: "I always manage to solve difficult problems if I try hard enough"). The response categories are (1) "not at all true", (2) "barely true", (3) "moderately true", and (4) "exactly true". This global measure refers to one's general sense of competence and effectiveness (Cronbach's alpha .86). All the items in the scale are job relevant but they capture individual self-appraisals. The instructions were referring to the work environment.

Organizational Citizenship Behavior (OCB). OCB was measured with a five-item scale as developed by Koys (2001). Each item is followed by a 5-point scale. Items were:

(a) "The employees work to exceed the customer's expectations" (Conscientiousness); (b) "I can count on my co-workers when I need help" (Altruism); (c) "The whole team feels responsible for our success" (Civic Virtue); (d) "The people I work with have a "can do" attitude" (Sportsmanship); and (e) "The people here treat each other with respect" (Courtesy) (Cronbach's alpha .84).

Performance estimations. Job incumbents assessed three aspects of work performance, both for oneself and for the team, i.e. the individual's assessment of own performance and performance of the work group that he or she spends most time in. Respondents assessed (a) the quality of general performance, and (b) the quality of their task specific performance, and (c) the quality of interpersonal skills. Each aspect was rated on a 10-point Likert scale. The Cronbach's Alpha for all 6 items was .72.

Well-being. Burnout was measured with a 20-item (Hallberg & Sverke, 2000) Swedish version of the Maslach Burnout Inventory (see e.g. Leiter & Maslach, 2005). The items were rated on a five-degree Likert scale. Emotional exhaustion, example item: I feel fatigued when I get up in the morning and have to face another day on the job. The Cronbach's Alpha for the 8 items was .79. Depersonalization, example item: I worry that this job is hardening me emotionally. The Cronbach's Alpha for 5 items was .60. Personal achievement, example item: I feel exhilarated after working closely with my patients The Cronbach's Alpha for the 7 items was .71.

Procedure

All questionnaires were translated by the first author of this article, and double checked for meaning and relevance, while the Burnout questionnaire and GSE questionnaire already existed in the Swedish language. All questionnaires were put in a web-based survey. The order of items was randomized within each questionnaire while the order of the questionnaires was fixed. The questionnaires appeared in the following order; demographics, PC, GSE, OCB, burnout and performance.

The participants were randomly selected within the health-care county and assigned to take part in the study. This was done at a central administration in the county where the hospitals and the health centers where located. Among 700 people invited to fill in the survey 600 actually accomplished the task and 599 questionnaires were valid and used in the subsequent analysis. This gives a response rate of 86 % which is fully satisfactory.

After collection and analyses of the data were done, all participants at the county hospital had the opportunity to attend a presentation of the results by the first author of this study.

Results

Survey Measurements issues

Prior to data analysis, we needed to assess the distinctiveness of our climate constructs. We expected that all 10 climate factors referred to three major dimensions and subsequently the three climate constructs were actually part of a single higher order climate. An AMOS confirmatory factor analysis was used in which the fit of a 3-dimensions model (i.e., factors allowed to only load on their respective climate scale) was assessed

and then compared with a single-factor model (i.e., all factors load on one general factor). Because of our medium size sample of individuals, we used the entire population of this study to test the models and to reach our conclusions. The three-factor model was acceptable and provided a good fit with the data and a better fit compared to the single-factor model. Chi-square difference tests and other fit measurements provided additional support (see Table 1).

Table 1. **Goodness-of-Fit for Confirmatory Factor Analyses of Climate Measures**

Model	Chi-square	df	RMSEA	CMIN/DF	CFI
3-dimensions model	384.00	44	.09	7.9	.94
Single-factor model	324.46	41	.11	8.7	.90

Following the guidelines from *Hair*, Anderson, Tatham and Black (1998), the three factor model has reasonable fit but not the one factor model. The results presented in Table 1 also confirm the previous validation of the model as in D'Amato & Zilstra (2008). The scales' reliability was also proved for each single factor, as shown by the Cronbach's alpha. All scales had an adequate to good reliability, with indices ranging from .63 to .90. Descriptive statistics are presented in Table 2.

Table 2. **Means, standard deviations, and first order correlations of the study variables**

	Means (SD)	1	2	3	4	5	6	7	8	9	10
Job procedures (1)	3.93										
SD/p	0.58										
Managerial practices (2)	3.44	.71									
SD/p	0.70	.000									
Organizational policies (3)	3.24	.74	.75								
SD/p	0.60	.000	.000								
Self-efficacy 1 (4)	3.09	.23	.18	.20							
SD/p	0.46	.000	.000	.000							
Self-efficacy 2 (5)	3.14	.23	.17	.19	.66						
SD/p	0.46	.000	.000	.000	.000						
OCB1 (6)	4.56	.25	.19	.25	.06	.09					
SD/p	0.67	.000	.000	.000	N.S.	.03					
OCB2 (7)	4.35	.56	.51	.56	.13	.08	.41				
SD/p	0.74	.000	.000	.000	.002	N.S.	.000				
Ind. Performance (8)	7.3	.09	.03	.01	.30	.08	-.03	.07			
SD/p	1.4	.03	N.S.	N.S.	.000	N.S.	N.S:	N.S.			
Team performance (9)	7.5	.29	.31	.30	.20	.40	.40	.39	.79		
SD/p	1.3	.000	.000	.000	.000	.000	.000	.000	.000		
Emotional Exhaustion (10)	2.36	-.50	-.56	-.45	-.28	-.31	-.15	-.41	.08	-.19	
SD/p	0.60	.000	.000	.000	.000	.000	.000	.000	.039	.000	
Depersonalization (11)	1.91	-.39	-.43	-.38	-.22	-.22	-.17	-.37	-.07	-.25	.56
SD/p	0.43	.000	.000	.000	.000	.000	.000	.000	N.S.	.000	.000

All three foundation issues or dimensions of climate (organizational policies, management practice, and job procedure) were positively correlated with each other. The aspects of self-efficacy are moderately associated with psychological climate dimensions but more so with job procedure than the other two dimensions. As noted before (D'Amato & Ziljstra, 2008), self-efficacy influences the way people use the autonomy they have in their job. The OCB indicators were related to all three climate dimensions. Team performance correlated more highly with other factors in the model than individual performance. As can be seen from Table 1, the three foundation issues of psychological climate do not correlate with self-reported individual performance but do with group performance. General self-efficacy correlates positively with both performance dimensions, negatively with burnout, and weakly with OCB and all PC factors. Burnout correlates negatively with group performance, OCB and all PC-factors.

OCB correlates with group performance but not individual performance. Burnout correlated negatively with all other measurements except for a non-significant relation between emotional exhaustion and individual performance.

To explore differences across the different occupations at the hospital, univariate ANOVA (SPSS version 16.0) analyses were performed together with Tukey post hoc analyses. Both occupational therapists and physiotherapists reported higher values on the autonomy factor (F 5.21 (7,591), p <.0001). Medical secretaries reported higher values on the intra team factor (F 3.84 (7,591), p <.0001). Physicians reported higher values on the reward factor (F 2.7 (7,591), p <.009) and physiotherapists higher values on job procedure (F 2.5 (7,591), p <.014). Otherwise no significant differences across occupations were found and therefore further analyses were based on the entire sample.

The research model

The next step was to assess the model whether both organizational and individual/personal factors contributed to OCB and in turn to both individual well-being and performance at work. For the purpose of testing the proposed research model, SEM analyses with AMOS (version 17.0) was used. Initial support for our hypotheses can be gained by examining either fig. 1 or Table 2. The results of the analyses supported the general model previously proposed in the literature.

Minimization was achieved (chi-square 283.18, DF=40, p=.000). The model fitted the data quite well (figure 1). As Figure 1 shows, we found that climate as a higher order factor positively relates to OCB, such as a positive climate compared to engagement with work (.91). Furthermore, the higher the self-efficacy perceived by the individuals the better the commitment to work and willingness to go above and beyond duties and calls (.17). Lastly, we found that OCB perceptions positively relate to performance (.13) and negatively relate to burnout (-.77).

As previously stated we used AMOS to test mediations, however evidence must be demonstrated.to infer that the climate and self-efficacy, the two distal constructs, are theoretically linked to the outcomes In this specific sample the correlation patterns of GSE and PC with outcomes prove the connection (see Table 2). The relationship among the distal predictive factors and the mediators have also been presented (figure 1).

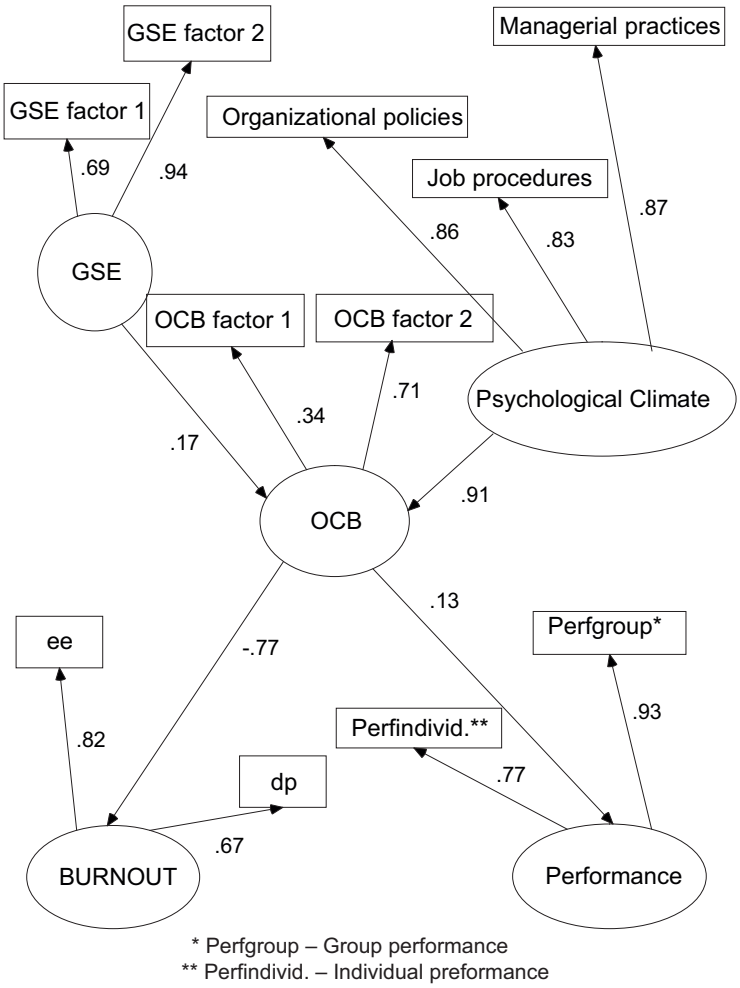

Figure 1. **A model in which work behavior mediates between the independent variables climate and GSE, and the outcomes of burnout and performance.**

The Structural equation modeling was used to test the hypothesis that the relationship between independent (climate and GSE) and dependent (burnout and performance) variables is mediated by OCB (Chi-square = 292.16, DF = 40, p = .000). The goodness of fit indicators were: RSMEA = .089, NFI = .94, CMIN/DF = 5.79, CMIN = 231.6 and CFI = .95. The RMSEA takes into account the error of approximation in the population. This index tells how well a studied model fits the population covariance matrix-if it is available. One of the older models provides restricted criteria to analyze the goodness of fit in structural equation modeling (e.g. Browne & Cudeck, 1992); in our study we consider more recent proposals that are having a greater impact in how models should be assessed. One of the most recent models, proposed by Hair et al. (1998) provides guidelines for interpreting the RMSEA as follows: RMSEA < .05, good model fit; .05 < RMSEA < .10, reasonable model fit, RMSEA >.10, poor model fit. The RSMEA in the present study was just above .08 indicating an error of approximation that is reasonable. These together

with other goodness of fit indicators, for example the CFI value of .95, testify that the default model can be accepted and considered valid. Traditionally, a CFI value of .90 or greater are interpreted as indication of appropriate fit (Bentler & Bonett, 1980).

The model indicates that there is a strong association between climate and OCB (y =.85), and that OCB was negatively associated with burnout. The expected positive relation between OCB and performance was weaker than found in earlier studies (D´Amato & Ziljstra, 2008).

Discussion

One aim of the study was to validate the Swedish version of the M_DOQ10. Results based on Cronbach Alpha values show that the instrument has a reasonably high validity. A second aim of the study was to test the research model suggested by D'Amato and Ziljstra (2008).

Although, not really measuring specific measures of climate such as climate for service, climate for innovation, or climate for work resumption, this research has helped confirm Schneider et al.'s. (2000) claim that more general foundation climate factors relate to organizational outcomes via more specific climates Wallace, Popp, & Mondore, 2006) as well as the previously comprehensive tested framework of the joint influence of environmental and personal factors on significant outcomes.

We found strong evidence that the perceived appraisal of the organizational policies, practices and procedures together with the employees' perceptions of themselves have a positive and significant impact on work behavior as well as replicating the finding that OCB impact on individual and organizational outcomes. This suggests that it is important for organizations to continue to engage and strengthen procedures and policies that are perceived to demonstrate concern and support for their employees as well as leadership to envisage and implement fair procedures to create and maintain a positive climate across the organizational environment. In short, these findings suggest that the higher the appraisal of the working conditions, the higher people's commitment at work with subsequent positive outcomes.

Perhaps the most important finding in the current study was demonstrating the mediating role of OCB besides replicating a previously validated model in a different national context.

We found OCB to be influenced by organizational climate appraisals and individual factors. The model with OCB as a mediator factor between independent variables (climate and GSE) and dependent variables (burnout and performance) was supported. Some differences compared to earlier findings were found. OCB appears to mediate the relationship between psychological climate and self-efficacy, and burnout and performance. However, self-efficacy had a weaker effect on OCB than in earlier studies (D'Amato & Ziljstra, 2008). The path between climate and OCB was much stronger than the path between self-efficacy and OCB.

This point is particularly important for both researchers and practitioners insofar as it can confirm the priority of shared perceptions/appraisals of work context to direct employees` behavior. The differences found in this study compared with the previous

ones were that self-efficacy had a positive relationship with OCB and the relationship between OCB and performance was weaker, otherwise the model was confirmed. From the research angle, it demonstrates how the model holds across national cultures/boundaries and across occupations. For researchers, this extends and confirms the climate framework by providing evidence for three foundation climates and how such broad climates relate to organizational outcomes via work behavior. As far as practitioners are concerned, this result demonstrate that employees' appraisal of the working environment and individual strengths can impact organizational effectiveness indices directly connected to the bottom line (i.e., performance) and well-being of the workforce.

For practitioners, this research might allow them to enhance their services by providing empirical evidence that perceptions of the organization and better feeling about themselves are critical to work outcomes, such as both employees' well-being and effectiveness at work. This is particularly relevant for health personnel who are always at the forefront as far as burnout is concerned.

From our point of view this is particularly important because usually organizational interventions to enhance well-being at work have focused on the individual (Hofmann & Stetzer, 1996).

However, from our perspective one of the key question is how broader contextual factors in conjunction with personal ones influence work behavior and the resulting outcomes. This means the development of feeling of burnout and also the individual performance at work. Previous studies (Hofmann & Stetzer, 1996; Wallace et al., 2006) demonstrated the impact of contextual factors on safety behaviors. The results of the present study extend the previous framework by introducing a different outcome measure in addition to person-related evaluations. The present study demonstrated the relevance of more factors and therefore interventions should target more variables in an effort to promote better working conditions and outcomes, other than to engage and support people. By incorporating such methods at any organizational level, interventions might have a larger effect on overall individual and organizational effectiveness as well as on general well-being at work. Furthermore, since organizational climate has been repeatedly demonstrated to have a strong connection with leadership and managerial practices, a deep intervention at any level of supervision would help to create a positive working environment and enhance employees' willingness to comply with their job and even beyond.

Limitations and future directions

Whereas the current study has expanded our understanding of comprehensive models for organizational life, this is not without limitations. First, the current study relied on self-reports. There is a plethora of attacks as well as defense in the literature on this topic. For example, Donaldson and Grant-Vallone (2002) outline four factors that influence self-report bias; the state of affairs (socially undesirable behaviors), sensitivity of context, dispositional characteristics (propensity to give socially desirable answers), and situational characteristics (pressure to give socially desirable answers). Although the context studied here is relatively low on all four self-report bias issues, it is important in the future to compare self-report data with objective measures. The self-report data

do not provide information about absolute values of relationships between variables. Nevertheless the aim of the study was to test a model and the data were adequate for such a purpose. Future studies, with the aim of examining statistical significance as well as model fit should use both self-report data and observation data. The cross-sectional design does not provide information about causal inferences. Therefore, longitudinal designs at the moment are at the planning stage.

A second limitation concerns the sample. We sampled from a specific industry sector only (the health industry) and this could potentially impact the generalizability of our findings, notwithstanding the support of the previous study by D'Amato and Zijlstra (2008) in a different national culture. We therefore present these results as tentative until future studies are reported that replicate these findings in larger samples and more industries. It will be our case to examine the relationships discovered in the present study in a sample of education workers as the work these individuals complete is different from that of health workers.

A third limitation that we can highlight from this study is the lack of objective data on outcomes. Because of organizational policy, as well as the fact that a clear record was not always available, we were unable to obtain further information about the individuals and their performance and health records.

There were also several positive features in this study. The use of a random sample within the workplaces of interest kept the dropouts to a minimum. An additional strength was the data collection across a number of centers used in this study compared to previous studies that have relied on a single organizational context. Having a sample representing a multitude of organizations in the same sector, the health industry, as well as involving workers in different roles, allows us to aim toward generalization. Our sample allowed us to overcome some of the potential biases when working with a single group or organization, as large as it can be, but where a strong identity or progress toward homogeneity happens and influences the ways situations are presented. Thus the strengths of this study have allowed us to draw stronger inferences.

These findings offer several avenues for future research. Some of the possibilities have been mentioned above, but other possibilities exist as well. For example, one could integrate organizational leadership into the tested model. Perhaps organizational leadership might have a strong influence on foundation climates and work behavior, or even impact self-efficacy. It is possible that better leadership could enhance the positive relationships among climate relations, work behavior, as well as well-being and performance.

The results of the present investigation have expanded our understanding based on a comprehensive model and some foundation variables to better understand organizations. In this framework the right emphasis and statistical "weight" is placed on the concurrence of individual as well as organizational factors. However, future research is needed to identify additional variables and moderating conditions that influence the outcomes. This study answers the call to investigate a comprehensive model and we hope that other researchers will build on this study to further investigate both the foundations of climate as well as the impact on work behavior and both individual and organizational outcomes.

One aim for future research is to conduct multicultural comparisons regarding the model presented in this study. Data from different cultures are being analyzed (D'Amato & Eisele, working paper).

Further, future research has the goal of using both self-report data and either supervisor data or data based on direct observations. Another aim is to further explore the most important mediating factors, OCB as in the present study, but also other possible new variables within the domain of either cognitive regulation or work behavior.

Conclusion

To conclude, psychological climate is a concept that provides an adequate description of work life. The holistic model examined in the present study, that includes both personal characteristics and work behavior, fits the data well even in a cross-cultural framework. This testifies for the universal use of the concept, at least in Western national cultures. Although generalisations across different occupations are important it was considered at this stage of research to compare the studies from different cultures using the same kind of population.

In the modern ageing as well as fast changing societies, organizations are highly aware of the need to find and retain their human capital and develop talent as a whole. With the emphasis on organizational climate we wanted to contribute a further answer to fundamental questions. First, do workplace attitudes about climate impact work behaviour? Second, what is the impact on individual and organizational wellbeing? Lastly, is a holistic model the way forward to understand the work environment? And how culturally founded is it? Our study showed that a holistic model describing employees' attitudes toward climate and their relationship to both performance and wellbeing is valid in different cultures.

Managing health care workers in a changing society requires new knowledge, thus demanding the adoption of relevant sets of organizational policies, practices and procedures. A work environment, as perceived by the employees, which fosters OCB is an important asset in high performance oriented organizations, and it is wise to understand that this can be also positively impact on individuals' wellbeing, or absence of burnout. As in the satisfaction mirror (Heskett, Sasser, & Schlesinger, 1997) we might foresee how providing good service for health care workers will enhance their wellbeing; this will possibly impact on people's self-esteem and in turn enhance their perception of their work environment.

Because of the positive and beneficial effect on climate toward individuals and organizations we suggest further examination of the role of climate on outcomes across cultures, and a deeper understanding of its correlates in the individual domain. Our results offer a significant advance toward better predicting and explaining organizational outcomes in health care services. Moreover, by linking climate appraisals to individual factors, such as self-esteem, we explicitly show that individuals also play a role in the work context. Contextual and individual factors each have their role in facilitating organizational progress and development.

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A Multi-Level examination of supervisors' and subordinates' personality and role behavior: Implications for work group effectiveness

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This study seeks to test the relationships between the Five-Factor model personality traits and role behavior in hierarchically-structured organizational groups. Since role behavior has been proposed as a linking mechanism between group member personality traits and group performance, this study aims to compare the relative contributions of supervisor and subordinate personalities and role behaviors in predicting objectively-measured group effectiveness. Dominance role behavior is of special interest in this study, since it can be perceived as a sign of leader competence by followers, enhancing leader influence. The distinction between task dominance and expressive dominance is made and supervisors' task dominance is explored to see if it modifies the relationship between supervisors' personality and group effectiveness. Using a sample of 31 supervisors and 221 subordinates within 31 branches of a bank in Latvia, results of multi-level modeling showed that personality traits predict task dominance and expressive dominance, but not friendliness; and formal status predicts task dominance, but not expressive dominance and friendliness. Results of statistical stepwise regression analysis showed that subordinates' agreeableness and openness to experience predict group effectiveness, while supervisors' personality traits do not. Finally, results of hierarchical regression analysis showed that supervisors' task dominance within their groups moderated the relationship between supervisors' neuroticism and group effectiveness. Supervisors' neuroticism was related to group effectiveness positively, but only when supervisors were perceived by subordinates as task leaders. Implications for organizational practice and future research are discussed.

Key words: supervisor, subordinate, personality, role behavior, work groups, group effectiveness.

Introduction

Globally, work in organizations is increasingly structured around groups instead of individuals (Devine, Clayton, Philips, Dunford, & Melner, 1999). Groups and teams can produce synergistic gains in performance and member satisfaction, but they can also impede productivity and frustrate their members (Hackman, 1987). The key to favorable group outcomes lies in the interaction between group members. Group composition (e.g., group size, member demographic characteristics, abilities, and personality traits) is a widely studied determinant of group effectiveness (Hollenbeck, DeRue, & Guzzo, 2004;

Kozlowski & Ilgen, 2006). In this study, the focus is on group personality composition. Recent meta-analyses using the Five-Factor model of personality have established group personality composition as a valid predictor of group performance (Bell, 2007; Peeters, Van Tuijl, Rutte, & Reymen, 2006).

Despite active research in the field, several questions remain unanswered. Only a few studies have measured potential mediating mechanisms of the relationship between group personality composition and group effectiveness (Barrick, Stewart, Neubert, & Mount, 1998). Stewart, Fulmer, and Barrick (2005) proposed the concept of roles (Bales, 1950) as a mechanism linking member personality to group performance. Yet, the relationship between personality and roles in hierarchically-structured groups, in which informal roles coexist with the formal roles of supervisors and subordinates, has not been studied. Previously, the relationship between personality and role behavior has been examined only in groups without formal leaders (Stewart et al., 2005). Therefore, it has not been determined whether supervisor role behavior has a larger impact on the group outcome than subordinate role behaviors. Also, personality traits and role behaviors have not been compared against each other as predictors of group outcomes.

The relationship between leader personality and group performance has been found to be an important topic in leader effectiveness research (Hogan, Curphy, & Hogan, 1994; Kaiser, Hogan, & Craig, 2008) and has been empirically studied before in hierarchically-structured groups (LePine, Hollenbeck, Ilgen, & Hedlund, 1997). Although leader personality is only one out of a complex set of factors determining group performance, theoretical models of the leader trait–leader effectiveness link have been proposed with potential mediating and moderating mechanisms within the leader trait paradigm (Judge, Piccolo, & Kosalka, 2009; Zaccaro, 2007). Within the social network approach, a formal leader's standing within a group's social structure has been shown to enable him or her to enhance group performance (Mehra, Dixon, Brass, & Robertson, 2006). If personality traits of leaders are resources for effective group functioning, and a leader's standing within his or her group enables the fostering of group performance, the moderating effect of the formal leader's standing within the group's social structure should be explored.

This study seeks to clarify the relationship between supervisor and subordinate personality traits, role behavior, and their importance as predictors of group effectiveness in customer service work groups within a bank's branch network in Latvia. This is the first field study to link personality and work group effectiveness in Latvia. A review of the existing literature on (1) the relationship between personality and role behavior, (2) the relationship between group personality composition and group effectiveness, including the importance of supervisor and subordinate personality, and (3) the relationship between supervisor task dominance and group effectiveness will be conducted. At the end of each section, key points are summarized and hypotheses are proposed.

Personality and Role Behavior

The Five-Factor model of personality (Costa & McCrae, 1992) is used in the current study because of its widespread use in group personality composition studies that allows accumulation of research findings within a common framework. Within Five-Factor theory, personality is defined as a dynamic psychological organization that coordinates

experience and action (McCrae & Costa, 2008). Although a universally accepted taxonomy of role behavior does not exist, Bales' (1950) model of task and social roles seems to have the most empirical support (Burke, 2003; Stewart et al., 2005). Within decision-making groups Bales' task role behavior includes problem-solving attempts and questions, while social role behavior includes positive and negative reactions. Group members can be ranked according to their activity (or dominance) in the task and social domains, indicating emergence of instrumental and expressive leaders (Bales & Slater, 1955). Later, Bales and Cohen (1979) revised the model, proposing three bipolar role dimensions: (1) dominance/ submissiveness, (2) friendly/ unfriendly behavior, and (3) task-oriented, authority-accepting/ expressive, authority-rejecting behavior. In the newer model task role behavior and expressive role behavior represent two poles of the same dimension, social role behavior is renamed into friendly/ unfriendly behavior, and dominance is added as a separate dimension.

Roles describe the structure of group interaction and each member's place in the group. Roles capture individual members' inputs into group processes in the eyes of other group members. A role is a set of behaviors, but also a form of social contract, that links an individual's position in a group with expectations about associated behaviors, such as rights and duties (Hare & Hare, 2001). Roles derive their meaning from the group context based on how individuals interact with other group members.

From a methodological standpoint, roles are inseparably tied to the group context. Therefore, role ratings of individuals from different groups cannot be treated as independent observations (Bryk & Raudenbush, 1992). However, in previous research the relationship between group member personality and roles has been examined without considering the nested structure of role ratings (Stewart, et al., 2005). This study will determine the proportion of within-group versus between-group variance in role ratings to gain better insight into the importance of their individual level predictors.

Conceptually, roles can be viewed as situational expressions of personality within a group (Stewart et al., 2005). There is some empirical evidence (Blumberg, 2001; Mumford, Van Iddekinge, Morgeson, & Campion, 2008; Stewart et al., 2005) that Five-Factor model traits relate to Bales' roles (Bales & Cohen, 1979). This study attempts to replicate previous findings from leaderless groups in hierarchically-structured bank branch work groups.

Expectation states theory (EST, Ridgeway & Berger, 1986) explains that when a hierarchy forms in leaderless groups, the person perceived as the most competent member will become the leader. In other words, status is conceptualized as *task status* and awarded to individuals according to their expected task contributions. Darioly and Schmid Mast (2011), similarly to Anderson & Kilduff (2009), found that in groups with established hierarchies the leader's perceived dominance is a marker of his or her task competence (or legitimacy), and incompetent leaders are perceived as less dominant. If, as according to EST, the basis of a formal leader's legitimacy lays within expected task contributions, i.e., within the task domain and not the social domain, task dominance and expressive dominance should be viewed separately. Previous studies show that agreeableness relates positively to social role behavior (friendliness) and neuroticism relates negatively to social role behavior (Blumberg, 2001; Stewart et al., 2005). Neuroticism and openness to experience relate negatively to task role behavior (Mumford et al., 2008; Stewart

et al., 2005). Conscientiousness relates positively to task role behavior (Blumberg, 2001; Stewart et al., 2005), and extraversion relates positively to dominance (Blumberg, 2001). Therefore, it can be expected that group member extraversion will relate positively to task dominance, conscientiousness will relate positively to task dominance, and openness and neuroticism will relate negatively to task dominance. Group member extraversion and openness will relate positively and conscientiousness will relate negatively to expressive dominance. Group member agreeableness will relate positively, and neuroticism will relate negatively, to friendliness.

Tett and Burnett (2003) found that organizational positions and related expectations can modify the expression of personality traits into behavior, including role behavior. There is evidence that formal status (position) relates positively and strongly to ratings of dominance and social influence within groups (Anderson, John, Keltner, & Kring, 2001; Harms, Roberts, & Wood, 2007). Since supervisors direct and manage the work of a group, it is proposed that supervisors would get higher ratings of task dominance than subordinates with the same levels of personality traits. Since expressive dominance is not related to the task domain, it is not expected to be related to the group supervisor position. Moskowitz, Suh, and Desaulniers (1994) demonstrated experimentally that there were no differences in levels of communion (acting more agreeable than quarrelsome), whether people interacted with supervisors, coworkers, or subordinates. Acting agreeable is conceptually close to social role behavior or friendliness (Bales & Cohen, 1979; Blumberg, 2001). Therefore, it is not expected that being in a group supervisor position would be related to his or her level of friendliness. To sum up, the following hypothesis is proposed:

H1: *Group member personality traits and formal status will predict group member role behavior.*

Personality, Role Behavior, and Group Effectiveness

Group effectiveness is a multi-dimensional construct that includes three aspects: (1) the result of group work (quantity or quality, speed, etc.), (2) group viability, and (3) members' individual growth and well-being (Hackman & Katz, 2010). Although all aspects are important for group functioning, the focus of this study is the outcome of group work. Group composition is one of the most widely studied prerequisites of group effectiveness (Hollenbeck et al., 2004). It includes the number of group members, their demographic characteristics, ability, and personality traits. The focus of this study is on personality traits. Two recent meta-analyses (Bell, 2007; Peeters et al., 2006) have shown that group member conscientiousness, agreeableness, and openness to experience relate positively to group performance. Yet, few studies have examined the processes or mechanisms through which personality produces its effect on group performance (Barrick et al., 1998; Stewart et al., 2005). Stewart et al. (2005) proposed group roles as a mechanism linking member personality to group outcomes. They showed that team member Five-Factor model personality traits relate to peer-ratings of social and task role behavior on the individual level. At the team level, they observed that the mean for social role behavior relates positively to social cohesion, the variance of social role behavior relates negatively to task performance, and the variance of task role behavior is negatively related to social cohesion.

The method for aggregating individual characteristics such as personality and role behaviors to group-level characteristics should be based on the nature of the group's task (Kozlowski & Bell, 2003; Moynihan & Peterson, 2001). Since work in bank branches is additive, such that each employee works independently with customers and the group performance outcome is the sum of individual efforts, subordinate personality traits and role behaviors at the group level are operationalized using the mean method, as suggested by Klein and Kozlowski (2000). Group goals are set top-down, according to the economic development of each location.

Research on group personality composition has been criticized for treating groups as undifferentiated entities (Humphrey, Morgeson, & Mannor, 2009). In reality, work in groups consists of mutually related roles with different functions. If the group has a formal supervisor who has more latitude of action and more responsibility for group outcomes than other members, his or her personality traits should be measured separately (Moynihan & Peterson, 2001). It is commonly accepted that monitoring work progress toward group goals and creating a supportive social climate are primarily the duties of managers (Kozlowski & Bell, 2003). On the other hand, other members of the group can engage in monitoring progress toward a common goal if they are interested in its achievement (Marks, Mathieu, & Zaccaro, 2001). Also, all members of the work group can provide important inputs into its social climate. Previous research has shown that employees turn to their peers for emotional support more often than they turn to their supervisors (Chiaburu & Harrison, 2008). Nevertheless, only two studies of group performance have studied leader and follower personality simultaneously (LePine et al., 1997; Taggar, Hackett, & Saha, 1999). When leaders and staff were simultaneously high on conscientiousness, a necessary personality resource for monitoring work, teams had higher job performance ratings (Taggar et al., 1999) and made more accurate decisions (LePine et al., 1997). Barrick et al. (1998) showed that group performance was higher when all group members had the necessary personality resources for smooth interpersonal interaction – high levels of agreeableness and low levels of neuroticism.

To date, only a single study has empirically linked Bales' roles and objectively measured group performance (Stewart et al., 2005). Stewart and colleagues found that the variance of social role behavior relates negatively to task performance. Contrary to expectations, none of the operationalizations of task role behavior were related to group task performance. This study was conducted with student groups that did not have established formal roles (e.g., supervisors and subordinates). Thus, the importance of group role behavior for hierarchically-organized work groups has yet to be examined. On the individual level, peer-ratings of social role behavior related positively to agreeableness and negatively to openness. Peer-ratings of task role behavior related positively to conscientiousness and negatively to neuroticism and extraversion.

To summarize, group member personality traits – agreeableness, conscientiousness, and openness – are positively related to the effectiveness of organizational groups (Bell, 2007). Group member personality traits are also related to role behaviors (Blumberg, 2001; Stewart et al., 2005). The pioneering study by Stewart et al. (2005) indicates that aggregated role behavior can predict group performance. Personality and role behavior have not been examined simultaneously as predictors of group effectiveness, and analysis

of hierarchically-structured organizational groups demands that a distinction be made between supervisor and subordinate characteristics. Therefore, this study investigates the relative contributions of supervisors' personality traits, subordinates' personality traits, supervisors' role behavior, and subordinates' role behavior as predictors of group effectiveness, and the following hypothesis is proposed:

H2: *Supervisors' personality traits, subordinates' personality traits, supervisors' role behavior, and subordinates' role behavior will predict group effectiveness.*

Supervisors' Task Dominance and Group Effectiveness

Bales' work on the emergence of leadership structures within freely-interacting groups (Bales & Slater, 1955) laid the foundation for research on the emergence of status hierarchies. The status of individuals or groups is defined as their social rank in terms of prestige or esteem (Levine & Hogg, 2010). Because status brings respect and deference, it is also closely associated with power. Within EST and status characteristics theory (Berger, Fisek, Norman, & Zelditch, 1977, as cited in Burke, 2003; Ridgeway & Berger, 1986), the emergence of status hierarchies is explained using expectations of member task contributions, thus, conceptualizing informal status within the group as *task status*. Only later, social-emotional behavior was added to the theoretical model as a mechanism that enforces or weakens existing task status hierarchies (Ridgeway & Johnson, 1990).

The capacity of an authority in a particular system to mobilize the support or resources necessary to ensure that system members comply with the authority's directives depends on the authority's legitimacy (Zelditch & Walker, 1984, as cited in Ridgeway & Berger, 1986). There are two sources of the authority's legitimacy: (1) resources granted to the authority from the larger organization or society and (2) direct, personal approval of subordinates within the system. Following Ridgeway and Berger's (1986) proposition that an individual's informal status within a group is mainly based on his or her expected task contributions, subordinate ratings of the supervisors' level of task dominance would indicate supervisors' competence and, thus, legitimacy in the eyes of subordinates (Darioly & Schmid Mast, 2011). Therefore, supervisors' receiving a higher task dominance ranking within their groups would be a sign of their enhanced legitimacy and, consequently, their influence beyond that granted to supervisors by their formal position.

Leader emergence, whether formal, in the form of a leadership position, or informal, in the form of follower attributions, is a necessary prerequisite for leader effectiveness (Judge, Bono, Ilies, & Gerhardt, 2002; Judge et al., 2009). The successful emergence of a leader in informal status hierarchies requires followers to see him or her as legitimate or competent (Ridgeway & Berger, 1986). It is also known that leader personality traits can support leader emergence and foster effectiveness of the leader's group, depending on situational demands (Judge et al., 2009). However, research on the relationship between a formal leader's informal emergence within the group's social structure and group processes or outcomes is quite scarce (Balkundi, Barsness, & Michael, 2009; Gross, Martin, & Darley, 1953; Mehra et al., 2006). Recent research indicates that higher informal status within the group, operationalized as network centrality, can enhance the formal leader's influence on group viability (Balkundi et al., 2009). Similarly, supervisors' highest position

in the task dominance ranking within their group is a sign of their legitimacy in the eyes of followers, which could facilitate supervisors' ability to use of their personality traits as resources for group effectiveness. Therefore, the following hypothesis is proposed:

H3: S*upervisors' task dominance moderates the relationship between supervisors' personality traits and group effectiveness, such that supervisors' traits relate to group effectiveness more strongly when supervisors' task dominance is high.*

Method

Participants

Participants were 31 bank branch supervisors and 221 banking specialists, a total of 252 employees, from the branch network of a large bank operating in Latvia. Eighty-two percent of participants were female. Among supervisors 61% were female; among specialists 88% were female. The mean age was 36 years. More than half of the participants (62%) had worked together for three years or more. Group size varied from four to 15 (M = 8.13, SD = 2.75).

Measures

Personality traits were measured using the Latvian version (Gabrāne, 2007; Van Skotere & Perepjolkina, 2011) of the 240-item NEO PI-R (Costa & McCrae, 1992). Respondents were asked to rate how accurately each statement describes them on a five-point scale, ranging from "strongly disagree" to "strongly agree." Reliability estimates (Cronbach's α) of the domain scales were .87 for neuroticism, .89 for extraversion, .85 for openness to experience, .90 for agreeableness, and .93 for conscientiousness. The equivalence of the Latvian and normative sample factor structures of the NEO – PI – R was tested using target rotation, as suggested by authors of the inventory. The Latvian version was generally factorially congruent with the original and had acceptable psychometric properties (see Van Skotere & Perepjolkina, 2011 for details).

Role behaviors were measured using peer ratings on a modified Latvian version of the SYMLOG Adjective Rating Form (Bales & Cohen, 1979). Participants rated how accurately the descriptors reflect the behavior of an individual on a scale from 0 to 4, where 0 was "never," 1 – "rarely," 2 – "sometimes," 3 – "often," and 4 – "always." Every group member, supervisors and subordinates, rated every other member except themselves.

Principal components analysis of the Latvian version of the SYMLOG Adjective Rating Form (Bales & Cohen, 1979) with oblique rotation revealed three components – unfriendliness, task dominance, and expressive dominance. Components were named after the dimensional codes ascribed by Bales and Cohen (1979) to their defining items (items with the highest factor loadings). Items with the highest loadings on each factor and lowest secondary loadings on other factors were selected to measure friendliness (items for this scale were reverse coded), task dominance, and expressive dominance. All items had factor loadings above .6. Reliability estimates (Cronbach's α) of the scales were .91 for friendliness (six items), .87 for task dominance (four items), and .80 for expressive dominance (four items). Examples of items measuring friendliness (reverse coded) were "*unfriendly, negative*", "*irritable, cynical, will not cooperate*". Examples of

items measuring task dominance were "*a purposeful democratic task leader*", "*analytical, task-oriented, problem-solving*", "*domineering, tough-minded, powerful*". Examples of items measuring expressive dominance were "*jokes around, expressive, dramatic*", "*extroverted, outgoing, positive*".

Supervisor task dominance[1] was measured using within-group ranking of task dominance scores. Supervisor task dominance was dummy-coded as low or high: 0 – "low, supervisor does not have the highest task dominance rating in the group"; 1 – "high, supervisor has the highest task dominance rating in the group".

Group effectiveness was measured as branch sales effectiveness. It was the average percentage of actual sales divided by target sales for the year across several criteria: new customers, loans, internet banking accounts, credit cards, debit cards, customers who actively use more than four services, and the total of active customers. Sales targets for branches differed according to the economic development of their location.

Availability of human resources and *availability of equipment* were included as control variables that can influence the ability of groups to achieve results (Ancona & Caldwell, 1992). Participants rated the extent to which their branch had available human resources and equipment on a 10-point scale, where 1 was "not very available," 5 –"average," and 10 – "very much available." Ratings were averaged within groups. Values of the within-group interrater agreement index r_{wg} (James, Demaree, & Wolf, 1984) ranged from .53 to .94 across groups for availability of human resources and from .8 to .89 for availability of equipment, justifying the averaging of individual ratings to group level scores (Bliese, 2000).

Group size was included as a structural variable that can influence internal group processes (Bales, 1950). It was assessed using information from the organization's Human Resources Department.

Tenure with coworkers was included in the questionnaire, using categories that the bank's Human Resources Department uses for analyzing its workforce statistics: 1 – less than one year; 2 – one to three years; 3 – three to five years, and 4 – more than five years.

Gender was included in the questionnaire and dummy-coded: 0 – female, 1 – male.

Procedure

Questionnaire data was collected personally on site to ensure confidentiality of responses. Supervisors were interviewed about the factors fostering and impeding the effectiveness of their groups, to get a better understanding of study context.

Data analysis

To test hypothesis H1, multilevel modeling with HLM 6 software was conducted (Raudenbush, Bryk, & Congdon, 2004). Hypotheses H2 and H3 were tested using bivariate correlation analysis, statistical stepwise regression analysis, and hierarchical regression analysis with SPSS version 19.

[1] This describes the measure used for testing hypothesis H3. For testing hypothesis H2 the simple supervisor score on task dominance was used.

Results

Personality, Role Behavior, and Formal Status

Many correlations were found to be in the expected direction: extraversion correlated positively with task dominance, $r = .23$, $p < .01$. Conscientiousness correlated positively with task dominance, $r = 21$, $p < .01$. Openness did not correlate significantly with task dominance. Neuroticism correlated negatively with task dominance, $r = -.30$, $p < .01$. Extraversion correlated positively with expressive dominance, $r = .20$, $p < .01$. Conscientiousness and openness did not correlate significantly with expressive dominance. Agreeableness correlated positively with friendliness, $r = .14$, $p < .05$. Neuroticism did not have a significant relationship with friendliness (see Table 1).

Formal status correlated positively with task dominance, $r = .42$, $p < .01$. Supervisors received higher task dominance ratings than other group members. It was observed that men and more tenured coworkers received higher task dominance ratings from group members; supervisors had lower neuroticism, and higher extraversion and conscientiousness scores than subordinates; and men had lower neuroticism, lower agreeableness, and higher extraversion scores than women.

To determine the relative contributions of group member personality traits and formal status as predictors of each role behavior, the guidelines of Raudenbush and Bryk (2002) were followed for analyzing data with a nested structure (individuals within groups). First, a "null model" was estimated without predictors to determine how much individual-level variance is explained by individual factors and how much variance is due to between-group differences. Results showed that all three role behaviors have significant between-group variance, but the largest part of variance resides between individuals – 68% for friendliness, 92% for task dominance, and 83% for expressive dominance.

Next, random coefficient models for each of the three role behaviors (friendliness, task dominance, and expressive dominance) were estimated. The random coefficient model analyzed the personality-role relationship within the 31 work groups. Each group had its own regression equation with an intercept and slope such that the average intercept and slope of the 31 regression equations could be determined. This approach determined how much the intercepts and slopes varied from work group to work group.

The same set of predictors was used for each of the three role behavior dependent variables. Gender and tenure with coworkers as control variables were included, as previous research has reported gender differences in dominance/ submissiveness behavior (Moskowitz et al., 1994). The correlations in our sample reflect a similar tendency, in that men were found to have higher levels of task dominance behavior. Tenure with coworkers can also have a significant effect on role behavior; it has been found to be related to higher informal status and dominance (Anderson et al., 2001). These effects are also reflected in the correlations, in that more tenured coworkers had higher ratings of task dominance. Along with control variables, personality traits and a dummy variable for formal status (i.e. supervisor/ specialist) were included in each model. All predictors were centered around the group mean.

The predictor–criterion slopes were allowed to vary between groups. Although group means of friendliness varied significantly between groups, none of the predictor

Table 1. **Descriptive Statistics and Correlations for Personality Traits, Roles and Formal Status (N = 252)**

Variable	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1. Friendliness	17.30	3.76	-									
2. Task dominance	11.57	2.61	.20**	-								
3. Expressive dominance	12.96	2.17	.45**	.40**	-							
4. Neuroticism	9.91	18.71	-.06	-.30**	-.12	-						
5. Extraversion	102.47	16.35	-.08	.23**	.20**	-.28**	-					
6. Openness	103.67	13.30	.03	-.01	.05	.00	.41**	-				
7. Agreeableness	113.18	15.82	.14*	.00	.06	-.09	-.05	.15*	-			
8. Conscientiousness	121.08	17.98	.00	.21**	.02	-.42**	.34**	.18**	.40**	-		
9. Formal status	0.15	0.36	-.02	.42**	.09	-.40**	.26**	.08	.12	.21**	-	
10. Gender	0.17	0.38	.05	.20**	.02	-.29**	.17*	-.12	-.16*	-.01	.39**	-
11. Tenure with coworkers	3.97	1.15	-.09	.27**	.00	-.13*	-.10	.03	.33**	.21**	.25**	.09

Note. Gender is dummy-coded: 0 – female, 1 – male; formal status is dummy-coded: 0 – specialist, 1 – supervisor. *$p < .05$; **$p < .01$

variance components were significant, therefore, only their fixed effects are reported. For easier comparison, standardized beta-weights were also calculated and reported along with the unstandardized coefficients given in HLM6 outputs. On average within groups, gender was positively related to friendliness ratings, $\beta = 15$, $p < .05$, while tenure with coworkers was negatively related to friendliness ratings, $\beta = -.26$, $p < .01$. Men received higher friendliness ratings, whereas more tenured coworkers received lower friendliness ratings from their peers. In total, the model explained 32% of the 68% available between-individual variance in friendliness (see Table 2).

Table 2. **Fixed Effects for the Predictors of Friendliness (N = 252)**

Parameter	*B*	*SEB*	*β*
Gender	1.44	.54	.15*
Tenure with coworkers	-0.84	.16	-.26**
Neuroticism	-0.02	.02	-.10
Extraversion	-0.01	.01	-.04
Openness	-0.01	.02	-.04
Agreeableness	0.02	.02	.08
Conscientiousness	-0.02	.01	-.10
Formal status	-0.55	.57	-.05
R^2	.32		

Note. Gender is dummy-coded: 0 – female, 1 – male; formal status is dummy-coded: 0 – specialist, 1 – supervisor. *$p < .05$; **$p < .01$.

Results of the random coefficient model predicting task dominance show that although means of task dominance varied significantly between groups, none of the predictor variance components were significant and are, therefore, not reported. On average, tenure, $\beta = .25$, $p < .01$, and formal status, $\beta = 38$, $p < .01$, were positive predictors of task dominance within work groups (see Table 3).

Table 3. **Fixed Effects for the Predictors of Task Dominance (N = 252)**

Parameter	*B*	*SEB*	*β*
Gender	-0.19	.29	-.03
Tenure with coworkers	0.57	.13	.25**
Neuroticism	-0.01	.01	-.07
Extraversion	0.03	.01	.19**
Openness	-0.02	.01	-.10*
Agreeableness	-0.03	.01	-.18**
Conscientiousness	0.00	.01	.00
Formal status	2.76	.34	.38**
R^2	.40		

Note. Gender is dummy-coded: 0 – female, 1 – male; formal status is dummy-coded: 0 – specialist, 1 – supervisor. *$p < .05$; **$p < .01$.

More tenured coworkers and supervisors received higher task dominance ratings from other group members. Extraversion was positively related to task dominance, β = .19, p < .01, and agreeableness, β = -.18, p < .01, and openness, β = -.10, p < .05, were negatively related to task dominance. More extraverted members received higher task dominance ratings, while more agreeable and more open members received lower task dominance ratings from their peers. In total, the model explained 40% of the 92% available between-individual variance in task dominance (see Table 3).

Results of the random coefficient model predicting expressive dominance demonstrate that, on average within groups, extraversion was positively related, β = .23, p < .01, and conscientiousness negatively related, β = -.17, p < .01, to expressive dominance. More extraverted members received higher expressive dominance ratings, while more conscientious members received lower expressive dominance ratings from their coworkers. In total, the model explained 31% of the 83% available between-individual variance in expressive dominance (see Table 4).

To sum up, hypothesis H1 was partially supported: personality traits and formal status were significant predictors of group member role behaviors. As expected, personality traits and formal status predicted task dominance, and personality traits predicted expressive dominance. Contrary to expectations, personality traits did not predict friendliness

Table 4. **Fixed Effects for the Predictors of Expressive Dominance (N = 252)**

Parameter	*B*	*SEB*	*β*
Gender	-0.32	.32	-.06
Tenure with coworkers	-0.09	.09	-.05
Neuroticism	-0.01	.01	-.09
Extraversion	0.03	.01	.23**
Openness	-0.02	.01	-.12
Agreeableness	0.01	.01	.07
Conscientiousness	-0.02	.01	-.17**
Formal status	0.24	.35	.04
R^2	.31		

Note. Gender is dummy-coded: 0 – female, 1 – male; formal status is dummy-coded: 0 – specialist, 1 – supervisor. **p < .01.

Supervisor and Subordinate Personalities, Role Behaviors, and Group Effectiveness

Correlations showed that aggregated subordinate conscientiousness, r = .39, p < .05, aggregated subordinate agreeableness, r = .44, p < 0.5, and aggregated subordinate openness, r = .48, p < .01, were positively related to group effectiveness (see Table 5). It is also worth noting that supervisor agreeableness, r = .44, p < .05, and openness to experience, r = .40, p < .05, correlated positively with subordinate mean levels of agreeableness and openness to experience.

Table 5. **Descriptive Statistics and Correlations for Group Effectiveness, Supervisor and Subordinate Personality Traits and Roles (N = 31 group)**

Variable	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1. Group effectiveness	83.65	12.36	-									
2. Supervisor neuroticism	74.82	23.23	.11	-								
3. Supervisor extraversion	112.09	13.79	.12	-.32	-							
4. Supervisor openness	104.65	13.30	.29	.24	-.09	-						
5. Supervisor agreeableness	117.94	14.00	.23	-.30	.36*	.28	-					
6. Supervisor conscientiousness	129.49	19.97	.09	-.72**	.42*	-.03	.36	-				
7. Subordinate neuroticism	93.48	7.01	.00	.48**	.29	.17	.01	-.22	-			
8. Subordinate extraversion	10.22	7.72	.23	-.01	.21	.13	.21	.08	-.12	-		
9. Subordinate openness	102.81	7.03	.44*	.22	.37*	.40*	.30	-.13	.26	.65**	-	
10. Subordinate agreeableness	112.26	8.34	.48**	-.24	.12	.44*	.44*	.08	-.05	.01	.27	-
11. Subordinate conscientiousness	119.46	9.79	.39*	-.42*	.17	.11	.22	.29	-.31	.44*	.43*	.50**
12. Supervisor friendliness	16.98	3.41	.10	.02	-.22	.08	-.11	-.22	-.06	-.12	-.01	.05
13. Supervisor TD	14.43	1.97	.19	-.22	-.17	-.03	-.36*	.29	-.42*	-.12	-.14	.04
14. Supervisor ED	13.19	1.73	.24	.00	.07	-.22	-.30	-.16	-.28	.00	.04	.11
15. Subordinate friendliness	17.54	2.50	.36*	-.24	-.04	.27	.09	.25	-.10	-.09	.03	.43*
16. Subordinate TD	11.24	1.11	.30	-.35	.22	.13	.21	.30	-.33	-.01	.06	.44*
17. Subordinate ED	12.98	1.19	.16	.01	.03	.28	-.02	-.05	-.18	.10	.23	.18
18. Group size	8.42	2.75	-.02	.63**	-.12	.01	-.27	-.43*	.35	.11	.07	-.25
19. Tenure with coworkers	3.99	0.57	.22	-.20	.07	.44*	.45*	.04	-.30	-.05	.18	.56**
20. Supervisor gender	0.39	0.50	.23	-.19	-.03	.06	.03	.07	-.29	.21	.02	.12
21. Human resources	7.24	1.02	.26	-.14	-.14	.22	.05	.07	-.28	.08	.04	.27
22. Equipment	7.28	0.78	.25	-.33	.21	.14	.07	.30	-.41*	.12	.17	.15

Note. TD – task dominance, ED – expressive dominance. Supervisor gender is dummy-coded: 0 – female, 1 – male.*$p < 0.05$; **$p < 0.01$. Tenure with coworkers is the group average of member tenure with coworkers.

Table 5 (cont.). **Descriptive statistics and Correlations for Group Effectiveness, Supervisor and Subordinate Personality Traits and Roles (N = 31 group)**

Variable	*M*	*SD*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
12. Supervisor friendliness	16.98	3.41	-.09	-									
13. Supervisor TD	14.43	1.97	.29	.25	-								
14. Supervisor ED	13.19	1.73	.11	.50**	.42*	-							
15. Subordinate friendliness	17.54	2.50	.12	.53**	.45*	.11	-						
16. Subordinate TD	11.24	1.11	.23	-.01	.32	.18	.55**	-					
17. Subordinate ED	12.98	1.19	.00	.32	.23	.33	.53**	.75**	-				
18. Group size	8.13	2.75	-.25	-.20	-.23	.09	-.49**	-.47**	-.34	-			
19. Tenure with coworkers	3.99	0.57	.46**	.02	.08	.14	.04	.39*	.22	-.22	-		
20. Supervisor gender	0.39	0.50	.19	.22	-.08	.14	.15	.01	.00	-.10	.15	-	
21. Human resources	7.24	1.02	.40*	-.07	.18	-.15	.19	.18	-.09	.07	.33	.12	-
22. Equipment	7.28	0.78	.41*	.08	.42*	.24	.28	.67**	.53**	-.38*	.41*	-.02	.45*

Note. TD – task dominance, ED – expressive dominance. Supervisor gender is dummy-coded: 0 – female, 1 – male. *$p < .05$; **$p < .01$.

A statistical stepwise regression analysis of group effectiveness was conducted with supervisor and subordinate personality traits and roles, group size, group mean tenure with coworkers, supervisor gender, human resource availability, and availability of equipment as predictors. Hypothesis H2 was partially supported. Subordinate mean levels of agreeableness and openness to experience emerged as the best unique predictors of group effectiveness (see Table 6). The model explained 29% (adjusted R^2) of the variance in group effectiveness, F (2, 28) = 7.02, $p < .01$. Beta weights showed that both variables were positively related to group effectiveness. The contribution of agreeableness in predicting group effectiveness was slightly higher.

Table 6. **Results of Statistical Stepwise Regression Analysis Predicting Group Effectiveness from Supervisor and Subordinate Personalities, and Role Behaviors (N = 31 group)**

Variable	*B*	*SEB*	*β*
Subordinate agreeableness	0.58	.24	.39*
Subordinate openness	0.59	.28	.33*
R^2 = .33, adjusted R^2 = .29, F (2,28) = 7.02, $p < .05$			

*$p < .05$

Supervisors' Personality, Supervisors' Task Dominance, and Group Effectiveness

From the 31 supervisors, 16 had the highest task dominance rank in their groups and 15 did not. Supervisors' task dominance was negatively related to supervisors' agreeableness, r = -.36, $p < .05$, in that more agreeable supervisors had lower task dominance than less agreeable supervisors. Supervisors' task dominance was positively related to ratings of equipment availability, r = .42, $p < .05$ – availability of equipment was rated higher in groups where supervisors had high task dominance. Supervisors' gender was not related to supervisors' personality traits (see Table 7), although men had higher levels of extraversion and lower levels of neuroticism and agreeableness in the total sample (see Table 1).

To test hypothesis H3, five multivariate hierarchical regression analyses were conducted predicting group effectiveness from each of the supervisors' personality traits (step 1), supervisors' task dominance (step 2), and supervisors' trait and task dominance interaction (step 3). The analyses were conducted adding all control variables (group size, mean tenure with coworkers, availability of human resources, availability of equipment, and leader gender) before step 1. Since none of the control variables had significant contributions in predicting group effectiveness in the presence of predictor variables, they were omitted from the final models.

Hypothesis H3 was partially supported. Supervisors' task dominance moderated the relationship between supervisors' neuroticism and group effectiveness (see Table 8), but not for other personality traits. Supervisors' task dominance moderated the relationship between supervisors' neuroticism and group effectiveness such that neuroticism was positively related to group effectiveness when the supervisors' level of task dominance was high. The model with supervisors' neuroticism explained 23% (adjusted $R^{2.}$) of the

Table 7. **Descriptive Statistics and Correlations for Group Effectiveness, Supervisor Personality, and Supervisor Task Dominance (N = 31 group)**

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. Group effectiveness	83.65	12.36	-										
2. Supervisor neuroticism	74.82	23.23	.11	-									
3. Supervisor extraversion	112.09	13.79	.12	-.32	-								
4. Supervisor openness	104.65	13.30	.29	.24	-.09	-							
5. Supervisor agreeableness	117.94	14.00	.23	-.30	.36*	.28	-						
6. Supervisor conscientiousness	129.50	19.97	.09	-.72**	.42*	-.03	.36*	-					
7. Supervisor task dominance	14.43	1.97	.19	-.21	-.18	-.03	-.36*	.29	-				
8. Group size	8.13	2.75	-.02	.63**	-.12	.01	-.27	-.43*	-.23	-			
9. Tenure with coworkers	3.99	0.57	.22	-.21	.07	.44*	.45*	.04	.08	-.22	-		
10. Supervisor gender	0.39	0.50	.23	-.19	-.03	.06	.03	.07	-.08	-.10	.15	-	
11. Human resources	7.24	1.02	.26	-.14	-.14	.22	.05	.07	.18	.07	.33	.12	-
12. Equipment	7.28	0.78	.25	-.33	.21	.14	.07	.30	.42*	-.38*	.41*	-.02	.45*

Note. Supervisor gender is dummy-coded: 0 – female, 1 – male; supervisor task dominance is dummy-coded: 0 – supervisor does not have the highest task dominance rank in the group, 1 – supervisor has the highest task dominance rank in the group. *$p < .05$; **$p < .01$.

variance in group effectiveness, F (3, 27) = 3.98, $p < .05$. The supervisors' neuroticism-supervisor task dominance interaction explained an additional 14% of the variance in group effectiveness beyond contributions of supervisors' neuroticism and supervisors' task dominance.

Table 8. **Hierarchical Multiple Regression Analyses Predicting Group Effectiveness from Supervisor Neuroticism and Supervisor Task Dominance (N = 31 group)**

Predictor	*β*	*Δ R^2*	*R^2*	*Adjusted R^2*
Step 1		.01	.01	-.02
Supervisor neuroticism	.11			
Step 2		.15*	.17*	.11*
Supervisor neuroticism	.26			
Supervisor task dominance	.42*			
Step 3		.14*	.31*	.23*
Supervisor neuroticism	.39*			
Supervisor task dominance	.45*			
Supervisor neuroticism × supervisor task dominance	.40*			

Note: Step1 F (1, 29) = .34; Step 2 F (2, 28) =2.76*, Step 3 F (3, 27) = 3.98*;*$p < .05$.

A script for SPSS written by Hayes and Matthes (2009) was used to explore how the effect of supervisors' neuroticism on group effectiveness changes depending on the levels of the moderator (supervisors' task dominance). Supervisors' neuroticism was positively related to group effectiveness only when the supervisors' task dominance was high. When the supervisor's task dominance was low, neuroticism did not have a significant relationship with group effectiveness (see Figure 1).

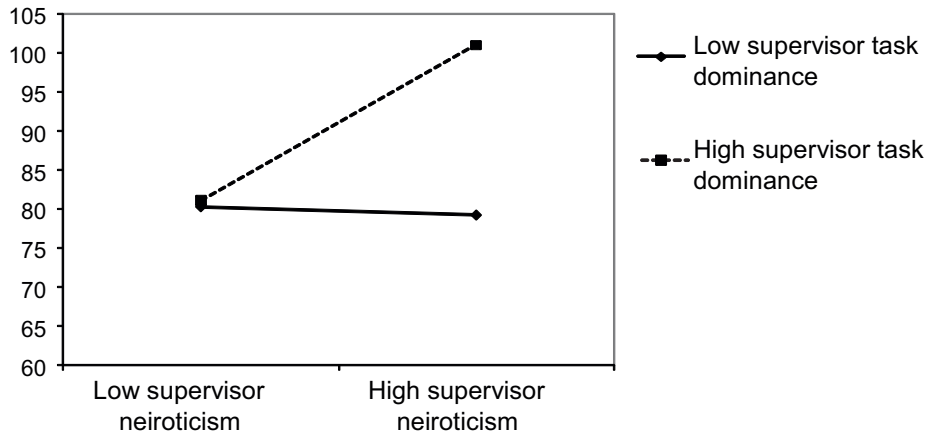

Figure 1. **Moderating effect of supervisors' task dominance on the relationship of supervisors' neuroticism and group effectiveness.**

Discussion

Personality Traits and Formal Status: Predictors of Role Behaviors

The results add to previous research on personality and role behavior in that they show that personality traits predict group member role behaviors in not only in leaderless student or laboratory groups, but also in hierarchically-structured organizational work groups. All relationships between personality traits and role behaviors were in the theoretically expected directions. The results also confirmed the theoretical assumption (Ridgeway & Berger, 1986) that status hierarchies are based primarily on perceived contributions within the task, not the social-emotional domain, in that task dominance was associated with formal status, while expressive dominance was not. Supervisors received higher task dominance ratings than other group members, while there were no differences in friendliness and expressive dominance ratings. More tenured coworkers also received higher task dominance (and not expressive dominance) ratings, which is consistent with other research (Anderson et al., 2001; Harms et al., 2007), where tenure with the group was related to higher social status and influence. Tenure with coworkers was also associated negatively with friendliness, which is not unexpected, since Ridgeway and Johnson (1990) hypothesized that more tenured group members are more likely to show negative emotions or act unfriendly towards less tenured colleagues. Men also received higher task dominance ratings than women, which is consistent with previous studies, in which men were rated higher on agent (dominant) behaviors than women (Moskowitz et al., 1994). Interestingly, men received higher ratings on friendliness than women. Moskowitz et al. (1994) found the opposite relationship in their experimental study – women had higher levels of communal behavior (being more agreeable than quarrelsome) than men. This finding may be due to the mainly female sample, where men might feel less pressure to act competitively and aggressively than in predominantly male groups, thus being perceived as more friendly, while women might feel the need to compete with other women (Chatman & O'Reilly, 2004).

Although agreeableness correlated positively with friendliness as hypothesized, its contribution as a predictor of friendliness along with other personality traits was not significant. Personality traits seem to be less of a predictor of group member friendliness than tenure and gender. Since extraversion includes aspects of both positive emotionality and assertiveness, it was expected to relate positively to both task and expressive dominance, which was supported. Although conscientiousness correlated positively with task dominance, it was not a significant predictor when other personality traits were included in the model. An interesting topic for future research regarding role behavior in work groups would be to investigate how rather generic role behaviors correlate with job behaviors critical for group goal achievement and how role behaviors relate to the narrow traits of the five personality factors.

Subordinate Personality: A Significant Predictor of Group Effectiveness

Subordinates' agreeableness and openness to experience appear to have helped group achieve group sales goals. Agreeableness has been linked to higher job performance in customer service jobs (Barrick, Mount, & Judge, 2001). The positive effect of openness could be related to the fact that data was collected during a phase of high competition for

market share among banks. To differentiate from competitors providing similar services with similar conditions, specialists had to try new approaches and be creative to keep existing customers and attract new ones.

The results showed that subordinate personality was more important than supervisor personality for achieving sales goals. This finding might seem contradictory to the leader trait paradigm literature where leader personality has traditionally been ascribed a heavy weight in achieving group results (see Zaccaro, 2007 for a recent review). Nevertheless, empirical research on leader and follower personality and group performance in frontline groups doing additive work is practically non-existent. In this study, the nature of the group work is additive, meaning that group effectiveness in achieving sales goals results from the sum of all members' inputs. Most of the supervisors are themselves involved in the sales process (making loans), in addition to being responsible for supervising the sales process for the entire group. Taking into account that group goal achievement is the sum of inputs, it is not surprising that inputs of many (subordinates) would have more weight than the input of one (supervisor). Regarding the other function of supervisors, supervising the sales process for the entire group, the results did not support a disproportionately larger effect of any supervisor personality resources on the group result. This finding may be explained by the fact that supervisors within the organization studied try to select and retain people whom they do not have to control (monitor), and the power distance between supervisors and subordinates is low. Competent and independent team members who are able to monitor their own progress and take corrective actions often came up during conversations with supervisors as key to success in sales goal achievement. Power distance between supervisors and subordinates might be low because, in many cases, supervisors are themselves selected by upper management from the group, whom they now supervise.

In this study supervisor agreeableness was positively correlated with subordinate agreeableness, and supervisor openness was positively correlated with subordinate openness. Supervisors within the organization studied select their group members, so they have the opportunity to develop a similar-to-them homogeneous personality pool within the group (Schneider, 1987). This factor suggests that supervisor personality may have an indirect effect on group effectiveness if supervisors attract, select, and retain employees similar to themselves on those personality traits that matter for group effectiveness.

Contrary to expectations, supervisor and subordinate role behaviors (friendliness, task dominance, and expressive dominance) were not related to group effectiveness. The findings indicate that mean levels of role behaviors may not characterize group processes well enough in customer service groups performing additive tasks, such as bank branches. Future studies should explore whether or not role distribution and variability indices (as used by Stewart et al., 2005) are better predictors of group effectiveness.

Supervisors' Task Dominance: Moderator of Supervisors' Neuroticism and Group Effectiveness

As expected, supervisors' task dominance moderated the relationship between supervisors' personality and group effectiveness, but this result was true only for one of the

five personality traits: neuroticism. Groups that were led by a supervisor higher on neuroticism had higher effectiveness, but only if the supervisor also had the highest task dominance rating within the group. This finding is interesting, since previous research has shown a negative effect of group member neuroticism on communication processes and job performance ratings (e.g., Barrick, et al., 1998), and leader emotional stability has been linked to higher follower ratings of leader effectiveness (Judge, et al., 2002). Nevertheless, the distinction between smooth communication, liking, and task processes is not a new finding. Bales' role differentiation theory states that directing the task and maintaining relationships are contradicting functions, since task leadership activities can raise negative emotions within followers (Bales & Slater, 1955). Later, it was experimentally found that task and social leadership role differentiation tends to occur only when the task leader lacks the legitimacy to demand task fulfillment (Burke, 1971). Since the highest rank in task dominance within their groups gives supervisors additional legitimacy beyond that granted by their formal status, it seems to allow supervisors' neuroticism to function as a resource for group effectiveness. Judge et al. (2009) described how traditionally "dark" traits of personality can have their "bright" sides, or evolutionary significance, allowing successful adjustment to environmental demands. Emotional stability, the "bright", opposite pole of neuroticism, has its "dark" sides regarding leadership effectiveness. Highly emotionally-stable leaders rarely experience highs and lows, thus, rarely leaving an emotional impression on their followers. Lack of emotions can be perceived as a lack of interest and indifference. Therefore, relatively neurotic supervisors could be perceived by their subordinates as motivating, for example, if supervisors express anxiety about the current situation or (lack of) progress towards group goal achievement.

Limitations

One limitation of this study is its cross-sectional approach – a longitudinal design would allow for a more precise understanding of the relationships between group effectiveness, group personality composition, and group roles. Also, data was collected from a rather small group-level sample within one organization. On the one hand, this limits the generalizability of results; on the other hand it allows control over factors like organizational culture, business strategy, and compensation systems. These factors can influence the types of individuals that are attracted, selected, and retained within organizations and provide alternative explanations for relationships between supervisor and subordinate personality traits and group effectiveness. This study has a small group-level sample size. This factor may be advantageous in that it makes the test of relationships more conservative, since practically insignificant, very small relationships are less likely to be found statistically significant in smaller samples. Finally, the current study is focused narrowly on a single, objective measure of group effectiveness – the level of achievement of sales goals, such that it is unable to provide answers to questions about the relationship between supervisor and subordinate personalities and role behaviors to other aspects of group effectiveness, such as group viability and member satisfaction. However, this study fills a gap in the literature in that it links objectively-measured frontline group work results to leader (supervisor) personality, and studies using objective group result measures on this organizational level have been quite rare so far.

Implications and directions for future research

The findings of this study may be useful for designing personnel selection practices in banks and other organizations that have work groups performing additive tasks to achieve collective group goals. Tests measuring the five factors of personality could be used as one of the selection methods. However, validation studies should first be conducted within each organization, since mean levels of personality traits can differ between organizations. Desirable levels of personality traits should be determined based on comparative analysis of high-performer and low-performer personality for each job. Examining the link between supervisor and subordinate personality, aspects of group effectiveness (e.g., group viability), role behavior variance, configuration, and group effectiveness could be fruitful areas for future research. These findings should also be replicated in other industries and tested at multiple management levels. It would be also interesting to test the cross-cultural replicability of the findings.

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Effects of individual planning prior to teamwork on generation of ideas and goals

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The purpose of Experiment 1 was to compare the effects of structured vs non-structured interaction and individual planning prior to interaction vs no planning on group performance, i.e. number of ideas generated. Participants (N = 99) were randomly assigned to 3-person groups. Analysis indicated that both strategies increased effectiveness of groups working on a task requiring creativity. Experiment 2 was a field experiment with 57 participants who worked in 3-person groups on an idea and goal-generating task. In Experiment 3 (N = 216), a more complex design was used to test the validity of initial findings in the first two experiments. Analysis showed that individual planning prior to interaction increase number of ideas but not of goals.

Key words: Group performance, idea generation in groups.

Introduction

Techniques aimed at increasing creativity in groups have become increasingly popular (see, e.g., Paulus, 2000). Studying the effects of prior planning and the effectiveness of various group techniques is important because many factors appear to restrain creativity in groups, but at the same time interaction in groups and teams can be an important source of creative ideas and innovations. It seems that process gains as well as losses are possible, probably due to situational factors which differentially affect both group member's motivation and resource coordination among group members.

The non-structured or conventional interaction style is characterised by undue influence by high-status people (Hare, 1976), pressure for conformity (Hoffman, 1979), and more general losses of coordination and motivation (see e.g. Paulus, 2000). Thus making the best out of group discussion involves replacing conventional interaction with more structured form. The three best known techniques are Delphi, the Nominal Group Technique (NGT) and the Stepladder technique (SLT). The nominal group technique (Delbecq, VandeVen, & Gustafson, 1975) and the improved nominal group technique (Fox, 1989) are characterised by an initial individual silent session prior to face-to-face interaction.

One theoretical model of creativity in idea-generating groups (Paulus, 2000) incorporates both motivation and coordination aspects of productivity (idea-generation). Another model, Search for Ideas in Associative Memory, focuses more on cognitive processes and was developed to explain why group members are unable to use waiting periods during interaction productively. According to the model creators: "Idea generation has two phases, with problem-relevant knowledge being activated in a first phase,

followed by idea-generation in a second phase". During non structured interaction production blocking should affect both phases, with lack of predictability of waiting periods inhibiting the more effortful processes of knowledge activation, and length of waiting periods interfering with idea generation" (Nijstad, Stroebe, & Lodewijks, 2003). Group interaction has been shown to lead to reduction in failures experienced which may affect perception of satisfaction (Nijstad, Stroebe, & Lodewijks, 2006). To deal with this inhibition and interference associated with production blocking improved forms of brainstorming have emerged. Brainstorming is a group creativity technique designed to generate a large number of ideas for the solution of a problem (Osborn, 1963). Brainstorming is a classic research topic together with group goal setting, stress, and group performance, group decision-making and relatively new areas like for instance collective induction (Kerr & Tindale, 2004).

Research on group performance research has been focused on increasing the effectiveness of interaction. Among those techniques investigated, two of the best known are the nominal group technique and the stepladder technique. The former involves an initial session of individual idea generating prior to interactive teamwork and thus separates an idea generating phase from an idea evaluation phase. The latter involves a two-person subgroup which begins preliminary discussions of the group task. After a fixed time interval, another member joins the subgroup. The essence of the technique is that additional members join the initial group one after the other after they have completed the group task individually.

The nominal group technique was developed to gain the benefits of group participation in problem solving while eliminating or minimizing problems such as nonproductive deviations from group task or destructive communication. It has been said that the nominal group technique (1) facilitates the generation of ideas, (2) encourages quality of participation and conservation of time, (3) emphasizes idea quality more than presenter status, and (4) prevents premature closure (Fox, 1989). In a well-known study by Van de Ven and Delbecq (1974), comparisons were made of the effectiveness of alternative group decision-making processes with conventional interaction. Effectiveness was defined as the quantity of unique ideas generated by a group and the perceived satisfaction group participants experienced with the decision process. In the study, 20 nominal group technique, 20 Delphi, and 20 interacting groups, each composed of 7 members were compared.

"Delphi is a multistep method used to solve problem or perform other intellectual tasks whereby group members exchange views and then each individually submits assumptions to an analyst who reviews all the data received and issues a summary report. The summary report is then discussed and reviewed individually by the group members who each submit revised forecasts to the analyst, who then reviews the material again and issues a secondary report. This process continues until all participants reach a common ground." (Van de Ven & Delbecq, 1974).

Both methods were more effective than conventional group discussions (Van de Ven & Delbecq, 1974). Hegedus and Rasmussen (1986) compared the effectiveness of the nominal group technique, unstructured group work, and individuals pooled efforts. The nominal group technique was found suitable for divisible evaluation tasks but less

useful for unitary evaluation tasks (Hegedus & Rasmussen, 1986). Divisible tasks can be done by different people while unitary tasks cannot.

The stepladder technique is intended to reduce the problems associated with group decision making by structuring the entry of group members into a core group and ensuring that each member contributes to the decision-making process. In a study with four-person groups randomly assigned to either the stepladder condition or the conventional group discussion condition, stepladder groups produced significantly higher quality decisions than did conventional groups (Rogelberg, Barnes-Farrell, & Lowe, 1992). In a second study, the stepladder technique was developed to facilitate group effectiveness by sequentially admitting members into a group. "Rather than the experimenter regulating the entry of members into a group this study examined stepladder groups which proceeded through the stepladder process at a self-determined pace (i.e., group members decided how much time to take at each step." (Rogelberg, & O'Connor, 1998). Analyses indicated that the stepladder groups produced group decisions of higher quality than conventional groups (Rogelberg, & O'Connor, 1998). Rogelberg, O'Connor and Sederburg (2002) examined audio conferencing groups using the stepladder technique to facilitate the decision-making performance of groups interacting via audio conference. Orpen (1997) also found that stepladder groups produced significantly better decisions than conventional groups.

However, although previous research indicates that both nominal groups and those formed using the stepladder technique generally outperform conventionally interactive groups on tasks involving discussion and joint judgment or decision making (see e.g Baruah & Paulus, 2008), companies still favour traditional group interaction because of benefits asssumed beyond the task itself. Therefore, an alternative approach to facilitating group meetings is now put forward, a technique involving individual planning prior to group interaction. The basic idea behind the use of an individual phase before and after interaction in groups is to increase each group member's contribution to the discussions and to increase each member's responsibility for the group outcome. The aim of the present study was to compare individual planning prior to interaction with both non-structured and structured interaction.

Recently Baruah and Paulus (2008) provided a detailed review of the effects of sequence of phases or paradigms on the group ideation process. Osborn (1963) had already proposed that the best order of work might be to work alone before participating in a group effort. There have however been mixed findings regarding the effects of such sequencing.

Dunnette, Campbell, and Jastaad (1963) found that group-to-individual sequence was best in enhancing generation of ideas. The group-to-alone sequence may be helpful if new associations and ideas are cognitively stimulated in group members during the group session. These ideas and unexpected associations generated in groups could lead to additional ideas in subsequent private sessions (Nagasundaram & Dennis, 1993). But Stein (1975) suggested that the individual-to-group brainstorming sequence is best because it allows individuals to prepare for the group session by first reflecting on their own ideas. In addition, Redmond, Mumford and Teach (1993) found that a structured period of preparation alone prior to group interaction was beneficial for group work.

However, the results of some other studies indicated that sequence had no effect on the overall performance of the group (Paulus, Larey, & Ortega, 1995; Rotter & Portugal, 1969). From these findings, it is not clear whether a particular sequence leads to the generation of more and better quality ideas.

In studies by Moon, Conlon, Humphrey, Quigley, Devers and Nowakowski (2003) support was found for the belief that group decisions are affected in systematic ways depending on whether or not there was individual contemplation of the decision problem before meeting as a group. To be more specific, groups given prior consideration compared to no given prior consideration both escalate their commitment more in ongoing decisions, and give better resource utilization of decisions (Moon et. al., 2003).

Planning is important to effective task performance in work groups and refers to efforts aimed at establishing aims and goals and also encourages discussions about time and temporal issues that can have beneficial effects on performance. Janicik and Bartel (2003) showed that initial temporal planning contributed to the formation of group norms that emphasize attention to time, and as the authors assumed also awareness of temporal aspects of task performance. These temporal norms were found to mediate the effect of temporal planning on coordination and task performance.

There are studies that have shown benefits of prior planning on team effectiveness. Teams engaged in collaborative planning managed to integrate valid information so that team performance strategies come to better use which in turn affected team effectiveness (Woolley, Gerbasi et al. 2008). Prichard and Ashleigh (2007) examined effects of team-skills training on transactive memory and performance. Teams that have been trained to develop team's skills as interpersonal relationships role allocation and goal setting performed better that teams not receiving any training. In the present study the individual planning prior to interaction is deliberately much simpler and shorter, the question being if a brief prior planning to interaction will have any effect on team performance.

The aim of the present study was to contribute to understanding of the effectiveness of groups in generating ideas by comparing the effects of individual planning with no planning before interaction. The justification for including this particular method in the study was based on the author's own work on making groups effective. Not much research has been conducted on effects of individual planning. The present paper was limited to approaches with the aim of improving interaction in groups. Other techniques for improving group processes (e.g. decision making) such as information intervention (see, e.g., Crott & Hansmann, 2003) were not included in the study. The main issue of Experiment 1 was the comparison of individual planning with the other two better known techniques (nominal group technique and stepladder). The hypotheses advanced are based on research previously described and on the assumption that an individual phase before social interaction will affect the effectiveness of task performance. The hypotheses are:

1. Structured interaction will generate more ideas than non-structured interaction.
2. An individual phase before face-to-face interaction in a group will generate more ideas than no individual phase.

Method

Experiment 1

Participants

A total of 99 participants who were taking either a course in social psychology or in work psychology volunteered to take part in the experiment. Age of the sample (51 women and 48 men) ranged from 22 to 41 years with a mean of 26 years.

Measure outcome and design

The outcome measured was number of ideas. Two students were recruited and trained to make observation made the assessment. In training the raters in observation technique, discussions about using only non-repetitive ideas were conducted. However, it was concluded that only the first idea is completely independent. Thus, the measurement included rater's observation of all ideas of each single group member and each group's report of the total number of ideas. As a result, both individual level data and group level data was obtained. The experimental design involved two factors. Factor one was structured interaction (nominal group technique and stepladder) versus non-structured interaction and factor two was individual planning before interaction versus no planning.

Procedure

Students taking part in classes in social psychology or work psychology volunteered to participate in the study. Participants were randomly assigned to one of the six cells (interaction type x planning prior to interaction, 3x2) of the design. The experimental session started with a brief description of the purpose of the study, and then all participants received a schedule in which they were informed about who their fellow group members were and when to start the group discussion. The schedule followed the design, starting with and no planning and nominal group technique group and ending with a no planning and non structured interaction group (see Table 1). The conditions were run in a randomised order.

The individual phase took place in one room and all group interaction in another room. In the individual planning prior to group interaction, which lasted for about 3 minutes, the participants were asked to contribute to a brief discussion about how they usually interact. The aim of this individual planning phase was to discuss very briefly with each group member how he or she should interact in the performing groups (created for study prupose). Participants in the no-planning condition also met the experimenter prior to interaction. During this individual planning phase the participants were not given any guidance on how to come up with self-generated ideas. That is. Information about the task of generating ideas was the same for all participants.

All groups were videotaped during interaction with exception of two groups. The two raters were seated in the group interaction room all time. They had a visible, but for the participating group members, neutral position on each side of the tripod with video camera. That is, they were seated so they did not disturb group work but were not hidden.

The task for the groups to perform was to come up with as many ideas for health promotion in the workplace as possible. The workgroups were told that they had 20 minutes to complete the task. Thus the participants were not provided with traditional brainstorming rules. After 20 minutes, a new debriefing took place in which the purpose of the study was clarified. All participants were paid a small fee and the two raters were paid for their work.

Results

The measurement had an interpreter reliability of $r = .67$ and a Cronbach alpha of .64. The correlation between group data and data from rater one was $r = .48$ and from rater two $r = .50$. The Cronbach alpha for all tree measurements was .62 ($n = 33$). Considering the rather low values, analyses were made for all three dependent variables separately

Analysis was performed using two-way analysis of variance. There was a main effect for interaction type (F (2, 98) = 3.33, $p = .04$) and for planning vs no planning prior to interaction (F (1, 98) = 5.9. $p = .02$) and no interaction effect was found. For the group data, the planning prior to interaction was (F (1, 31) = 8.5, $p = .003$) and interaction type (F (2, 31) = 5.01, $p = .014$) and no interaction effect was found (see Table 1). The Tukey-B test showed that data from the nominal group technique condition were significantly different from both non structured interaction and stepladder technique conditions. This finding applied the data from raters (observation) and from group data (self-report).

Table 1. **Means and standard deviations for structured vs nonstructured interaction and individual phase prior to interaction vs no planning.**

	Non structured interaction			*Nominal group technique*			*Stepladder technique*		
		M	***SD***		***M***	***SD***		***M***	***SD***
No planning	Observer 1 n=15	3.3	0.9	Observer 1 n=15	4.1	1.2	Observer 1 n=15	3.7	0.6
	Observer 2 n=15	3.9	1.1	Observer 2 n=15	3.9	0.8	Observer 2 n=15	3.7	0.9
	groupdata n=5	6.8	1.3	groupdata n=5	9.6	1.1	groupdata n=5	9.2	1.2
Planning	Observer 1 n=18	4.1	1.0	Observer 1 n=18	4.9	1.2	Observer 1 n=18	4.3	1.1
	Observer 2 n=18	4.4	1.1	Observer 2 n=18	4.6	1.1	Observer 2 n=18	4.1	1.1
	groupdata n=6	9.2	1.4	groupdata n=6	13.0	1.1	groupdata n=6	11.2	1.2

Thus, both hypotheses were supported. Participants in the structured interaction condition produced more ideas than participants in the non-structured condition. An individual phase before the face-to-face group interaction produced more ideas than interaction without an individual phase.

Discussion

Experiment 1 tested whether two structured interaction techniques and individual planning prior to interaction could increase effectiveness in groupwork. The nominal group technique was more effective than the stepladder technique. For different findings, supporting the stepladder technique, see Rogelberg et al (1992; 2002). A brief individual planning phase was also enough to increase effectiveness. However, this result needs to be replicated in several ways. Different type of indivual phases prior to interaction should be investigated. Other settings than the laboratory should be used.

Experiment 2

The major aim of the present study was to contribute to understanding the effectiveness of groups in generating ideas by comparing two different techniques for increasing team creativity. In Experiment 2, individual planning prior to interaction was studied in a field setting. In addition, numbers of goals generated were added as a second dependent variable.

Studies of creative thinking have often used a measure of number of ideas generated and less frequently number of goals generated. Ideas were defined as any statement regarded as an idea by the raters. Likewise, goals were defined as statements involving both process and outcome. That is, statements about both how to do it and what to do. For example, an idea about exercise during work hours could have the corresponding goal of giving free access to a pool during work hour. That is, a statement coded as a goal is more than a feasible idea in the sense that it involves implementation. Thus effectivity in teams was defined in the present study as number of ideas and goals generated.

In Experiment 1 it was found that individual planning prior to interaction resulted in more effective interaction compared with interaction without any individual planning. Experiment 2 was a field experiment done to test the hypothesis that individual planning prior to interaction in groups would increase number of ideas generated (H1) and number of goals generated (H2).

Participants and design

The participants ($N = 57$) attended counselling courses on the subject of initiating health promotion. In two groups, some of the members were not professionals but politicians responsible for healthcare. In all other groups, all participants were health-care professionals. Thus, these two particular groups of either only health-care professionals (homogenous groups) or both health care professionals and non professionals (heterogeneous groups) were randomised separately for the purpose of making the comparison more valid. Thus, the 14 homogenous groups and the 5 heterogeneous groups were assigned randomly to the planning condition ($n = 30$) and the no-planning condition ($n = 27$). Age ranged from 28 to 53 years ($M = 34.4$) with 43 women and 14 men. The groups consisted of three members and were matched, with one man in each group, to decrease gender differences.

The topic the groups discussed was relevant to all members and related to past experiences in their daily work.

Measurement

The quantitative measures consisted of both self-report data and observational data and concerned number of ideas and goals generated. The self-report data were estimates by each group member of the number of ideas and goals generated. The observational data were two independent raters who were briefly trained and received a small fee for their work in observing the teams and counting the numbers of ideas and goals generated. The raters were blind to all aspects of the study including designs, grouping and purpose.

Procedure

All participants were taking a course on health promotion. The first time the participants met the experimenter they were told about the research project and asked to participate. All participants were assigned randomly to the two conditions (individual planning prior to interaction and no planning). In one group, a group member was replaced, so that one person was not randomly assigned

A visible but discretely placed video camera recorded group work. All group members were asked to count the number of ideas and number of goals generated by the fellow group member on their right. Two independent raters counted number of ideas and number of goals generated. These raters had access to the video recordings for one day.

The individual planning phase prior to interaction consisted of a short meeting with the experimenter. Participants were asked about their social style during group work. After the answer to this initial question a brief discussion followed on how to behave to increase their involvement during the group session. After the completion of all group sessions a debriefing with all participants took place.

Note that all group members were aware that the group task was to generate ideas and goals. The individual planning phase contributed with a personal meeting with each group member. The participants in the individual planning condition were not given any information per se that would directly affect their idea generation. Group members in the no planning condition also met the experimenter individually, when information about the study in general was given.

Results

The interrater reliability was r =.86 for idea generation and r =.52 for goal generation and the Cronbach alpha for idea generation was .87 and for goal generation .72. The correlations between self-report data and observation data ranged from .27 to .81.

Testing of the hypotheses was performed with one-way ANOVA. There were significant differences between individual planning and no planning in number of generated ideas (F (1, 55) 7.01, p =. 011. Differences collected with self-report data regarding generation of ideas were not significant. There were no significant differences for generation of goals. The conclusion is that individual planning can be sufficient to enhance idea generation in small groups (Table 2).

Table 2. **Means and standard deviations of generated ideas and goals for the two conditions in the experiment.**

Measure		*No planning (n=27)*		*Planning (n=30)*	
		M	***SD***	***M***	***SD***
Self-report data					
	Number of ideas	5.1	1.0	5.9	1.1
	Number of goals	4.1	0.9	4.7	1.1
Observation data					
	Number of ideas	4.3	1.0	5.3	1.2
	Number of goals	4.1	0.8	4.8	0.9

Discussion

The results of Experiment 2 indicate that individual planning prior to interaction may increase number of ideas generated in three person groups. The experiment was rather exploratory and does not rule out alternative explanations like for example the *social entrainment process* (Kelly & McGrath, 1985). This means that, when an external stimulus (e.g., task or time constraint) is imposed on the group, pacing is modified. This modified pace tends to persist on later trials even when the initial constraint or stimulus condition does not hold any more.

However, the aim of Experiment 2 was to investigate whether individual planning prior to group discussion had any effect at all. Planned studies include the social entrainment process as one possible explanation for the effects of the individual-group sequence.

Experiment 3

Participants

A total of 216 participants, taking a course in psychology volunteered to take part in the experiment. Age of the sample (124 women and 92 men) ranged from 22 to 41 years with a mean of 26.0 years.

Measurement and design

The dependent variable was number of ideas and this was measured four times; in a short trial phase, a baseline phase, and before and after experimental manipulation. The experimental design involved two factors. Factor one was structured interaction (nominal group technique and stepladder) versus non-structured interaction and factor two was individual planning before interaction (social-oriented and task-oriented) versus no planning. Thus, the design was a 3x3 between group design with repeated measures.

Procedure

Students taking part in classes in psychology volunteered to participate in the study. Participants were randomly assigned into one of the six cells (interaction type x planning prior to interaction, 3x3) of the design. The experimental session started with a brief description of the purpose of the study, while avoiding information that could increase the likelihood of demand characteristics effects. All participants then received a schedule in which they were informed about who their fellow group members were and when to start group discussion. The schedule followed the design, starting with task-oriented planning and nominal group technique group and ending with a no planning and non structured interaction group. The conditions were run in a randomised order.

The individual phase took place in one room and all group interaction in another room. In the individual planning prior to group interaction, which lasted for about 3 minutes, the participants were asked to contribute to the interaction and to a brief discussion about how they usually interact. The aim of this individual planning phase was to very briefly discuss with each group member how they should interact in the groups. This was done in two different ways. One condition was task-focused and one condition had a focus on the social processes during group interaction. Participants in the no planning condition also met the experimenter prior to interaction. During this individual planning phase, the participants were not guided on how to come up with self-generated ideas. That is, information about the task of generating ideas was the same for all participants. Individual planning was kept to a minimum; in the task-oriented condition the word "task" was used during this brief meeting just before group interaction and in the social-oriented condition the words "social processes" were used in dialogue with participants. All groups were videotaped during interaction.

The task for the groups was to come up with as many ideas for health promotion in the workplace as possible. The workgroups were told that they had 20 minutes to complete the task. Thus the participants were not provided with traditional brainstorming rules. After 20 minutes, a new debriefing took place in which the purpose of the study was clarified. All the participants were paid a small fee and the two raters were paid for their work.

Results

Analysis was performed using ANOVA Repeated measures and MANOVA. The repeated measures analysis showed that there was a main effect for interaction type (F (2, 207) = 5.3, p = .006). The Tukey-b test showed that cell means from the nominal group technique condition were significantly different from both non-structured interaction and stepladder technique conditions.

The Manovas showed that the only significant effect was on the measurement after experimental manipulation, regarding interaction type (F (2, 207) = 13.9, p = .000) and for the planning prior to interaction it was (F (1, 207) = 2.6, p = .08). There were interaction effects (see Table 3).

Table 3. **Means and standard deviations for structured vs nonstructured interaction and individual phase prior to interaction vs no planning**

Conditions	*Non structured*			*Nominal group technique*			*Stepladder technique*		
		M	***SD***		***M***	***SD***		***M***	***SD***
No planning	Base	3.8	1.1	Base	3.7	0.9	Base	3.9	1.2
	Before	4.0	1.0	Before	4.0	0.7	Before	4.0	1.1
	After	4.2	1.3	After	4.6	0.9	After	4.3	1.1
Social-oriented planning	Base	3.9	0.8	Base	3.9	0.8	Base	3.7	1.1
	Before	3.9	0.9	Before	4.2	0.5	Before	3.8	0.8
	After	4.5	1.1	After	5.4	0.9	After	4.3	1.0
Task-oriented planning	Base	3.8	1.2	Base	3.4	1.0	Base	3.5	1.0
	Before	4.0	1.0	Before	4.2	0.9	Before	3.7	0.8
	After	4.3	1.0	After	5.3	0.9	After	4.3	1.1

Note: Base= baseline measurement. The other numbers in the cells refer to measurements before and after experimental manipulation (n = 24 in all cells).

Hypothesis 1 was supported and hypothesis 2 was not supported. Participants in the structured interaction condition produced more ideas than participants in the non-structured condition. An individual phase before the face-to-face group interaction did not produce more ideas than working without any such individual phase.

General discussion

In Experiment 1 individual planning as well as structured interaction (nominal group technique and stepladder technique) increased the number of ideas generated. Experiment 2, conducted with health-care professionals as participants, also led to the conclusion that individual planning prior to interaction can enhance idea generation in groups.

This finding is important because it can be a part of the explanation to the fact that brainwriting (e.g. Paulus & Yang, 2000) works better than traditional brainstorming. That is, the writing period is an individual phase prior to interaction and this is perhaps the most important factor that determine whether group effectiveness enhancing techniques works or not.

There are three main limitations in this study, the individual level data analysis, the cross sectional design and the use of ad hoc groups.

It is possible to analyse group performance at an individual level if the measurement also has been made for single group members that is being commensurable. The common practice is to collect data from individuals and aggregate them to yield a group score. This approach assumes homogeneity among parts which may not be true. But there are advantages to conducting analysis at the group level especially if data from the groups are interdependent. However, in the present study, the participants were completely randomly assigned to the experimental conditions.

The main result in this study may be important for different attempts to increase effectiveness of group interaction but we do not know if it is relevant for real life work groups. Studies should be undertaken both in laboratory settings using experimental designs and in the field using groups taking part in real-life meetings and involved in teamwork within a context.

Further, research is addressing the question of under what circumstances individual planning prior to interaction is sufficient to enhance interaction effectiveness is needed. It is for example not possible from these data to determine whether the planning period was beneficial because it had motivational effects (increased attention) or social-cognitive effects (better information exchange). Although the possible motivational effects were kept to a minimum by using a very brief individual planning session, this question should be addressed in future studies. To specify, it could be that the planning session has a motivational benefit in that participants may take the task more seriously. Alternatively, since this session encourages individual group members to take some ownership in how the task is done, they may be more intrinsically motivated. Another possibility is that the planning leads to some decisions or plans that function as goals for the group.

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Emotional Intelligence as a mediator between commanders' transformational leadership and soldiers' social identification with their unit in the military

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This study investigates the relationship between commanders' transformational leadership, soldiers' emotional intelligence and their social identification with their unit. The aim of this study was to test empirically how soldiers' emotional intelligence is related to their social identification in the military. The participants were 744 soldiers of the National Armed Forces of Latvia. The results show that soldiers' emotional intelligence predicts their social identification with their unit. The results also show a relationship between transformational leadership and soldiers' social identification through their emotional intelligence as a mediator. The findings suggest that transformational leaders may have an impact on soldiers' adaptation, stress management, and general mood. This implies that military leaders may strengthen soldiers' social identification with their unit by teaching and developing their emotional intelligence skills.

Key words: emotional intelligence, social identification, transformational leadership, military.

Introduction

Emotional intelligence and social identification

Although the number of emotional intelligence (EI) studies is growing, the debate about the measurement of EI and the extent to which EI significantly predicts different psychological constructs is continuing. There are several theoretical models of emotional intelligence (Bar-On, 1996, 2005; Goleman, 1995, Mayer, Salovey, & Caruso, 2000). The ability model of emotional intelligence put forth by Mayer and Salovey (1997) presented EI as a cognitive ability. Consequently, the ability EI model is measured with instruments designed to assess one's knowledge of emotions and one's ability to successfully recognize and work through problems involving emotions and instruments that measure ability. Bar-On (1997, 2000) had a more broadly defined interpretation of emotional intelligence including one's emotional, personal and social dimensions of general intelligence. According to the EI mixed model (Bar-On, 1997), emotional intelligence is defined as an array of non-cognitive capabilities, competencies, and skills that influence people's ability to succeed in coping with environmental demands and pressures. Because the mixed model contains non-cognitive dimensions, we believe that the mixed model of EI would offer a more inclusive measurement of emotional

intelligence and would be more appropriate to test the relationship between transformational leadership and EI.

The mixed model of EI is characterized as emotional competence based on adaptive behavior in relation to the job environment. EI includes an individual's knowledge related to emotions in addition to incorporating knowledge of motivation, personality traits, temperament, character and social skills (Bar-On, 2000). On the basis of emotional intelligence research in the work environment, the Bar-On mixed model is recognized as the most appropriate one (Zeidner, Matthews, & Roberts, 2004). In addition, EI mixed model components are consistent with the qualities required in a military leader and professional soldiers (Headquarters, Department of the Army, 2007). For example, EI intrapersonal factor refers to self-understanding, self-awareness and the ability to express one's feelings and ideas. Interpersonal factor is defined as the ability to be aware of, appreciate and understand others' feelings, and the ability to establish and maintain mutually satisfying relationships with other individuals (Bar-On, 2000). If one applies EI theory to the field of soldiers' professional development and training, it is apparent that the Armed Forces need soldiers who can work closely with people with various cultures, services and government agencies, and this requires tremendous interpersonal skills (Abrahams, 2007). Furthermore, the Armed Forces need soldiers who can adapt quickly to ambiguous and dangerous situations. These qualities are characterized by EI adaptability and stress management competencies.

Previous research shows that EI has predictive validity for job performance and effectiveness, highlighting EI self-consciousness of reality testing and problem-solving, and social responsibility factors as important predictors of job efficacy (Bar-On, 2000). Based on the recognition that individuals' EI can influence job performance, EI is recognized as an integral part of effective leadership and command climate in the military. Therefore leaders' ability to recognize and regulate their emotions and the emotions of their subordinates is a key factor in the relationship between military leaders and their subordinates. Soldiers with high emotional intelligence, who are more in tune with their own strengths and weaknesses and understand the emotional states of their comrades, are more able to fit in and cooperate within their units, and within the organization as a whole (Abrahams, 2007).

Research data indicate that EI is correlated with group cohesion through transformative leadership (Wang & Huang, 2009). The EI mixed model includes social skills, which are essential for teamwork, and EI helps group members to explore the weaknesses and strengths of the group, as well as to promote adaptability to organizational requirements, which is particularly important in stressful situations (Bar-On, 1997). Goleman (1995) argued that individuals with high EI possess the most effective leadership qualities, and, in addition, he focused on the ability to learn EI. Goleman and Boyatzis believe that EI can be learned if the proper training is used to teach individuals the competencies included in EI (Boyatzis, 2006; Goleman, 1998).

The individuals' recognition and regulation of emotion can reinforce positive self-esteem at workplace, which contributes to the social identity and self-concept, and to the individual's ability to integrate into the organization (Shamir et al., 2000; Zeidner, Matthews, & Roberts, 2004). Based on the recognition that social identity involves not only the cognitive component, but also the affective dimension, which is related to emotional

attachment to the group (Van Dick, 2004), there is reason to believe that an individual's affective or emotional aspects of social identification with a particular organization can be linked to emotional intelligence.

Social identification refers to a relatively enduring state that reflects an individual's readiness to define him or herself as a member of particular social group (Haslam, 2001). Van Knippenberg (2000) argued that identification is associated with motivation to achieve goals because it promotes individuals' identification with the organization and implement it goals and interests as their own. Perceived identification helps individuals to maintain a consistent view of self that is different from others, simultaneously enhancing self-esteem. The importance of emotion regulation in military settings has been emphasized before (Bartone, 2006). Studies of the military environment confirm that soldiers with low EI report low results in loyalty, communication skills, sense of humor and impact on the unit climate (Walter, Ulmer, & Shaler, 2004). To our knowledge, currently there are no empirical studies of the relationship between emotional intelligence and social identification in the military. Based on the theory and previous research, we suggest that soldiers' EI can predict their social identification with their unit.

Hypothesis 1. Soldiers' emotional intelligence predicts their social identification with their unit.

Transformational leadership

The studies of transformational leadership (Avolio, Bass & Jung, 1996; Bass, 1996, 1998; Bass & Avolio, 1990, 1991, 1993; Bass & Yammarino, 1991; Hater & Bass 1998) constitute a relatively new direction in military leadership research. Generally speaking, leadership may be characterized as either transactional or transformational. *Transactional leadership* is defined by setting up and defining agreements to achieve specific work objectives; it focuses on actively setting standards. Conversely, *transformational leaders* inspire the belief of followers so that they are potentially united in the pursuit of higher goals, the realization of which is tested by the achievement of a significant change (Bass & Avolio, 1990). Four components of transformational leadership have been described: charismatic leadership (or idealized influence), inspirational motivation, intellectual stimulation and individualized consideration (Bass, 1998). Researchers (Avolio & Bass, 2007) have noted that transformational leaders provide a symbolic emotional force for an organization. Some authors have found that emotional intelligence contributes to leadership effectiveness (Cann, 2004; Higgs & Aitken, 2003) and career development (Zeidner, Matthews, & Roberts, 2004). In recent studies, researchers (Antonakis, Ashkanasy, & Dasborough, 2009) have discussed whether emotional intelligence predicts leadership effectiveness, indicating that the relationship between emotional intelligence and transformational leadership is based more on theoretical reasoning rather than empirical evidence. Research on emotional intelligence and transformational leadership indicates a relation between the constructs (Barling, Slater, & Kelloway, 2000, Gardner & Stough, 2002; Sivanathan & Fekken, 2002). The relationship between transformational leadership and EI is largely defined by two underlying competences of effective leadership: the ability to monitor emotions in oneself and others and the ability to manage emotions (Barbuto & Burbach, 2006). Research shows that emotional intelligence is associated with three aspects of transformational leadership: idealized influence, inspirational motivation, and

individual consideration (Barling, Slater & Kelloway, 2000). In addition, transformational leadership is positively related to employee's feelings of optimism (McColl-Kennedy & Anderson, 2002).

One of the main tasks of military leaders is to build a relationship with subordinates, developing their morality and fighting capability (Headquarters, Department of the Army, 2007). In military leadership theory, it is emphasized that the leader's self-confidence and emotional control directly affect the efficiency of the unit in combat situations. Leaders need to know the strengths and weaknesses of their personality and be able to express emotions, to inspire subordinates; however, more important is to control and hide their negative emotions. It has been proposed that transformational leadership should have a positive effect on confidence and resilience by installing a sense of optimism in followers (Bass, 1998). Military leaders' general mood and emotions directly affect the cognitive skills of the subordinates, their interpersonal relationships and unit climate (Abrahams, 2007). Leaders with high EI are more able to provide feedback, understand the needs of their subordinates and improve the emotional atmosphere in the unit (Bullis & Reed, 2004). Since transformational leadership includes inspirational motivation and idealized influence factors, which are appealing to the emotions of the subordinates (Antonakis, Ashkanasy, & Dasborough, 2009), in the military context EI arguably plays a more important role than the general intelligence of the leader.

Shamir and his colleagues (Shamir, House, & Arthur, 1993) have noticed that leaders transform the behavior of their followers: they built personal and social identification among unit members according to the mission and the goals of the organization. The leaders' confidence in their own leadership abilities influences the performance of their subordinates, and is likely to raise their efficacy beliefs. In the military, soldiers' ability to identify themselves with their unit is probably the most important component of motivation for combat (Shamir, Brainin, Zakay, & Popper, 2000). These authors report empirical evidence linking transformational leadership to subordinates' identification with their unit.

Mediation model

Empirical research on the relationship between transformational leadership and social identification in the military is limited. We believe that there is a scientific need to examine empirically the role of EI in the relationship between transformational leadership and social identification in a military context. In this study we propose and test a mediator model that accounts for an indirect relationship between these two constructs.

Studies of military organizations provide evidence that there is a connection between transformational leadership and soldiers' social identification (Shamir, Zakay, Brainin, & Popper, 2000). However, the authors indicate that these findings may be contingent upon the organizational context and indirectly influenced by other psychological variables. In the present study we assumed that the connection between commanders' transformational leadership and soldiers' social identification might be mediated by soldiers' EI. Previous studies have indicated that transformational leaders promote the intellectual growth of subordinates (Bass, 1996); therefore, it is reasonable to believe that commanders' transformational leadership might contribute to the emotional intelligence of their subordinates, especially the dimensions of social responsibility, adaptation, interpersonal

relationships and problem-solving, which are the most important military leader's influence domains of soldiers' performance (Headquarters, Department of the Army, 2006).

This assumption is based on previous findings showing that transformational leadership is related to emotional intelligence (Barling, et al., 2000). Cherniss and Goleman (2001) propose that interventions targeted at EI-based competencies are effective and tend to enhance EI, and it is possible for adults to develop EI competencies. Some research results suggest that as one gets older, one becomes more emotionally and socially intelligent (Bar-On, 2005). Additionally, research in military settings has demonstrated a connection between soldiers' EI and psychological health, because emotion regulation contributes to stress resistance (Bar-On, 1997). The empirical findings from four studies show that emotionally and socially intelligent behavior can be enhanced in the workplace in order to improve performance, as well as self-actualization and subjective well-being (Bar-On, 2003; Dunkley, 1996; Sjolund & Gustafsson, 2001; Stone-McCown et al., 1998). The results from these studies suggest that EI factors described by the Bar-On model are both teachable and learnable, and that these factors can be enhanced by relatively simple methods over a relatively short period of time (Bar-On, 2005). By suggesting an indirect link between commanders' transformational leadership and subordinates' social identification via commanders' impact on the soldiers' emotional intelligence, we aim to complement and extend these previous findings. Leaders can use emotions as signals to direct followers' reactions to different circumstances and changes. Leaders are believed to generate enthusiasm and optimism in the work environment, and are said to be able to maintain an atmosphere of cooperation and trust through the development of high quality interpersonal relations (George, 2000; Zeidner, Matthews, & Roberts, 2004). Additionally, mood regulation is an important skill for leaders to develop because those who can manage their own emotions cope better with stressful situations than others do (Barbuto & Burbach, 2006).

Besides, their commander's professional competence and leadership significantly affect soldiers' combat readiness (Bartone, 2006). EI contributes to effective leadership by enhancing commanders' ability to recognize the feelings of their subordinates, their skill to influence their emotions and to get subordinates to perform their tasks willingly, which helps to achieve organizational goals (George, 2000). EI affects an individual's stress resistance and facilitates constructive behavior in stressful situations (Bar-On, 1997). In addition, EI is related to the individual's subjective well-being, which is a prerequisite for satisfaction with an occupation (Bar-On, et al., 2005). Based on military leadership theory (Headquarters, Department of the Army, 2007), where the main factor of soldiers' professional competence is psychological stability in stressful situations, and the fact that military leaders are responsible for the regulation of soldiers' morale in warfare, we assume that commanders' transformational leadership influences soldiers' EI and, through this influence, also indirectly facilitates soldiers' social identification with their unit.

Thus, we formulate the hypothesis that EI factors have a mediator effect in the relationship between transformational leadership and social identification.

Hypothesis 2. Soldiers' emotional intelligence mediates the relationship between the commander's transformational leadership behavior and the soldiers' identification with their unit.

Method

Participants

The study was carried out in the National Armed Forces of the Republic of Latvia. The sample consisted of 744 soldiers from different army units. Participants were asked to note their rank in three main military leadership levels: officers, non-commissioned officers and privates. One hundred seventy two participants were officers (OF), 20 of them were senior officers and 152 were junior officers. Two hundred thirty two participants were non-commissioned officers (NCO), 301 were privates (OR) and 39 were cadets. One hundred and fifty six soldiers had previous military mission experience; 586 (79%) of the soldiers were male and 158 (21%) were female. Sixty two percent of participants were 20 to 30 years old, 30% of soldiers were 31 to 40 years old, 7% of soldiers were 41 to 50 years old, and 1% was older than 51 years.

The leadership behavior of 156 commanders was rated by 588 subordinates. The commanders' group consisted of 20 senior officers (SOF), 60 junior officers (JOF) and 76 non-commissioned officers. 17 senior officers were male and three were female. Eight senior officers had previous mission experience. Of senior officers 55% were 31 to 40 years old, 25% – 41 to 50 years old and 20% – older than 51. Every senior officer was rated by six direct subordinates. In total, the senior officers' leadership was evaluated by 20 rater subgroups, with 120 raters in total. In the junior commanders group 49 participants were male and 11 were female; 28 of them had previous mission experience. Twenty eight percent of junior officers were 20 to 30 years old, 67% of soldiers were 31 to 40 years old, and 5% – 41 to 50 years old. Every junior officer was rated by four direct subordinates. Junior officers' leadership was evaluated by 60 rater groups, with the total number of raters amounting to 240. In the non-commissioned officers group there were 53 male and 23 female officers, and 19 of them had previous mission experience. Thirty eight percent of NCOs were 20 to 30 years old, 46% – 31 to 40 years old, 13% – 41 to 50 years old and 3% – older than 51. In this leadership level every NCO was rated by three direct subordinates, by 76 rater subgroups, 288 raters in total. The number of raters is different at various levels of military hierarchy due to different availability of subordinates and commanders at different levels of the hierarchy.

Measures

Emotional intelligence. We measured emotional intelligence with Bar-On's Emotional Quotient Inventory- EQ-i (1997), developed in Latvian (Gaitniece-Putane & Rascevska, 2006). This instrument includes 133 self-report items that participants rated on a 5-point Likert-type scale. The measure consists of five major components: intrapersonal EQ, interpersonal EQ, adaptability, stress management and general mood, with 15 subscales (self-awareness, assertiveness, self-regard, self-actualization, independence, empathy, interpersonal relationship, social responsibility, problem solving, reality testing, flexibility, stress tolerance, impulse control, happiness, and optimism). In order to test the first hypothesis we used EI subscale measures, and for testing the second hypothesis we used EI factor scores.

Transformational leadership. We used Bass and Avolio's (1995) Multifactor Leadership Questionnaire (Rater Form, MLQ 5X-Short) to measure military commanders'

transformational leadership. This questionnaire consists of 45 items assessing the frequency of transformational leadership behaviors on a 4-point scale ranging from 0 (not at all) to 4 (frequently, if not always). Our interest was in the transformational leadership behaviors, and therefore our measure consisted of the following complete subscales: idealized influence (attribution and behavior), inspirational motivation, intellectual stimulation and individualized consideration. The Multifactor Leadership Questionnaire was administered in the Latvian language (adapted by Landratova, 2006).

Social identification. The soldiers' social identification with their unit was measured using Doosje, Ellemers and Spears' (1995) four-item scale. Sample items were: "I see myself as a member of the unit"; "I am pleased to be a member of the unit". The responses were measured on a 7-point Likert-type scale, with higher scores corresponding to higher identification. The internal reliability of the scale in our study was Cronbach's α = .84.

Procedure

The study was carried out in the National Armed Forces of Latvia (NAF). First, the first author received the permission from the units' commanders. Then, the author approached participants individually at their base locations by debriefing them about the study and asking for their participation. Data were collected through direct contact with the respondents during which the objective of the study was explained. Soldiers under the direct supervision of each commander in the sample were asked to evaluate their commanders' leadership behavior, as well as to complete EQ-i and the social identification scale.

Results

To test Hypothesis 1 that soldiers' emotional intelligence predicts their social identification Multiple Regression Analysis was used. The results indicate that soldiers' emotional intelligence predicted 23% of variance in their social identification. The beta weights, presented in Table 1, suggests that soldiers' self-actualization, social responsibility, flexibility, stress tolerance and happiness contribute most to the prediction of social identification, and that self-awareness, self-regard and problem solving negatively predict soldiers' identification with their unit. A high level of soldiers' independence also influences social identification negatively.

We used the procedure suggested by Baron and Kenny (1986) to test Hypothesis 2 that soldiers' emotional intelligence is a mediator of the relationship between the commanders' transformational leadership and soldiers' social identification with their unit. In step 1, social identification was used as the criterion variable in a regression equation and transformational leadership was used as a predictor (model 1); in step 2 emotional intelligence factor scores were used as the criterion variables and transformational leadership as predictor; in step 3 social identification was used as the criterion variable in a regression equation and transformational leadership and emotional intelligence factor scores were used as predictors (model 2). In step 4, the regression coefficients in model 2 were compared to those in model 1. To prove that emotional intelligence factors mediate the relationship between transformational leadership and social identification, the regression coefficients of model 2 should be significantly weaker than those in model 1.

Mediator effect was examined separately for five emotional intelligence factors: interpersonal, intrapersonal, adaptation, stress management and general mood, using the Sobel test in SPSS (Preacher & Hayes, 2004). Unstandardized regression coefficients were used for calculating the Sobel test. Standardized coefficients are depicted in Figures 1-3.

Table 1. **Multiple Regression Analysis for Emotional Intelligence Variables Predicting Social Identification (N = 744)**

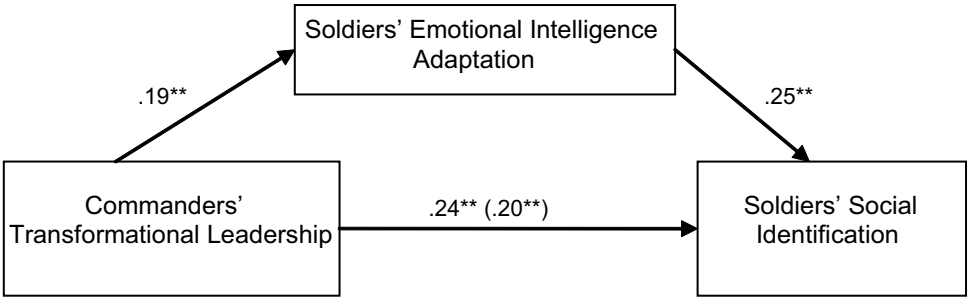
Independent variable	*B*	*SE B*	*β*
Self-awareness	-0.49	.11	-.21**
Assertiveness	-0.05	.12	-.02
Self-regard	-0.37	.11	-.19*
Self-actualization	0.88	.12	.41**
Independence	-022	.10	-.10*
Empathy	-0.07	.12	-.04
Interpersonal relationship	-0.05	.14	-.02
Social responsibility	0.32	.13	.14*
Problem solving	-0.34	.12	-.15*
Reality testing	0.10	.14	.04
Flexibility	0.25	.11	.10*
Stress tolerance	0.26	.14	.12*
Impulse control	0.09	.09	.05
Happiness	0.35	.13	.17*
Optimism	0.03	.13	.01
Constant	2.52	.77	

Note. $R^2 = .24$, $F(17.743) = 14.05$, $p < .001$
*$p < .05$. **$p < .01$.

The results show that there is no significant relationship between transformational leadership and interpersonal factor of emotional intelligence $\beta = .06$, $p = .125$; therefore interpersonal factor was not used to test the mediation model. The results indicate that the relationship between transformational leadership and social identification became weaker when the emotional intelligence factors of adaptation, stress management and general mood were included in the mediator model. The findings show that transformational leadership partially influences social identification through these emotional intelligence factors, suggesting the presence of mediation effects.

When the intrapersonal factor was added to the model, the relationship between transformational leadership and social identification did not change significantly (first model, $\beta = .24$, $p < .001$ and second model $\beta = .22$, $p < .001$). The Sobel test shows that the mediator effect was not significant, $z = 1.41$, $p > .05$. The results indicate a direct relationship between commanders' transformational leadership and soldiers' social identification with their unit, whereas the intrapersonal factor of soldiers' emotional intelligence has no significant mediator effect.

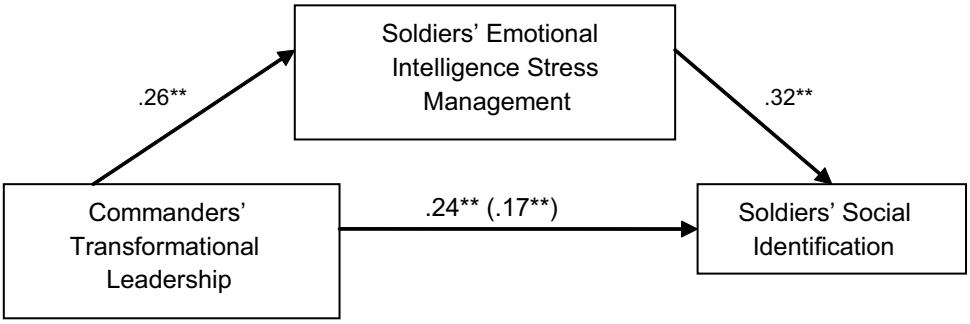
The mediator model indicates that there is a significant mediation effect of the adaptation factor in the relationship between transformational leadership and social identification (in model 1 $\beta = .24$, $p < 0.001$ and in model 2 $\beta = .20$, $p < 0.001$; Sobel test $z = 3.45$, $p < .001$, see Figure 1).



Note. Standardized regression coefficients (β). Values of model 2 in brackets *$p < .05$, **$p < .001$. The measurement of commanders' leadership is based on ratings of their subordinates (mean of raters' groups).

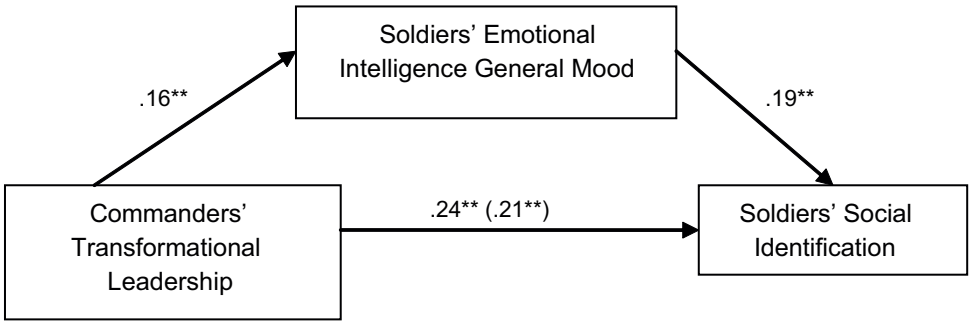
Figure 1. **The Effect of Commanders' Transformational Leadership on Soldiers' Social Identification with Their Unit through Soldiers' Adaptation as a Mediator Variable (N = 588)**

Similarly, the results show that there is a mediation effect of stress management in the relationship between transformational leadership and social identification (in model 1, $\beta = .24$, $p < .001$ and in model 2 $\beta = .17$, $p < .001$; Sobel test $z = 4.68$, $p < .001$, see Figure 2) and a mediation effect of soldiers' general mood, where in model 1 $\beta = .24$, $p < .001$ and in model 2 $\beta = .21$, $p < .001$ (Sobel test $z = 2.75$, $p < .05$, see Figure 3). To summarize, the emotional intelligence factors of adaptation, stress management and general mood partially mediate the relationship between commander's transformational leadership and soldiers' identification with their unit, whereas the remaining two factors (interpersonal and intrapersonal factor) do not play such mediating role.



Note. Standardized regression coefficients (β). Values of model 2 in brackets *$p < .05$, **$p < .001$. The measurement of commanders' leadership is based on ratings of their subordinates (mean of raters' groups).

Figure 2. **The Effect of Commanders' Transformational Leadership on Soldiers' Social Identification with Their Unit throught Soldiers' Stress Management as a Mediator Variable (N = 588)**



Note. Standardized regression coefficients (β). Values of model 2 in brackets $^{*}p < .05$, $^{**}p < .001$. The measurement of commanders' leadership is based on ratings of their subordinates (mean of raters' groups).

Figure 3. **The Effect of Commanders' Transformational Leadership on Soldiers' Social Identification with Their Unit throught Soldiers' General Mood as a Mediator Variable (N = 588)**

Discussion

The aim of the present study was to examine the underlying mechanisms of the relationship among military commanders' transformational leadership, their subordinates' emotional intelligence and their social identification. In this study, we confirmed the hypothesis that soldiers' emotional intelligence predicts soldiers' social identification with their unit. The significant predictors for social identification were the self-actualization, social responsibility, flexibility, stress tolerance and happiness subscales of emotional intelligence. The results indicate that low soldiers' self-awareness, self-regard and poor problem solving skills negatively influence soldiers' identification with their unit.

Our findings once again confirm the effectiveness of the mixed model of emotional intelligence in the workplace (Zeidner, Matthews, & Roberts, 2004), demonstrating its usefulness in a military context too. The model includes competencies that are important for professional soldiers (Headquarters, Department of the Army, 2007) and military leaders (Abrahams, 2007). Our results support the assumption that the affective/emotional factors play a significant role in formation and expression of social identity (Ellemers, et al., 1999, Van Dick, 2004). The findings are in line with earlier evidence showing a correlation between transformational leadership and soldiers' social identification with their unit (Shamir, Zakay, Brainin, & Popper, 2000).

The present study has tested a new hypothesis, explaining the relationship between commanders' transformational leadership and soldiers' social identification through the soldiers' EI factors as mediator variables. Our data suggest that soldiers' adaptation, stress management and the general mood factors of emotional intelligence have indirect effects on the relationship between commanders' transformational leadership and soldiers' social identification, reflected in a partial mediation effect. It had been pointed out before that the relationship between transformational leadership and social identification may be indirectly influenced by a number of variables (Shamir, Zakay, Brainin, & Popper, 2000). We tested the role of emotional intelligence as one such possible influence.

Our findings are in line with previous research where the EI factors discussed are positively correlated with transformational leadership on an individual level (Barling, et al., 2000). We go one step further, suggesting that commanders' transformational leadership may influence separate aspects of emotional intelligence in their subordinates, and through this, also affect their identification with their unit. Theoretically, such influence is possible and even feasible. The components of emotional intelligence that we found were mediators between transformational leadership and social identification are the ones most likely to be affected by transformational leadership behavior.

Adaptation and stress management are skills that can be facilitated by such transformational leadership behaviors as intellectual stimulation and individual consideration. Consequently, leaders should seek different perspectives in problem solving situations, spend time teaching and coaching and help others to develop their emotional strengths (Avolio & Bass, 2007). General mood, on the other hand, can be directly influenced by commander's behavior and attitudes towards their subordinates. Leaders' idealized influence and inspirational motivation increases followers' trust in the leader and the mission, and create a sense of optimism about the future (Barling, Slater & Kelloway, 2000; Bass, 1998; McColl-Kennedy & Anderson, 2002).

Our findings are also in line with the theoretical predictions that commanders' professional competence and leadership skills affect fighting capability of military units (Bartone, 2006) and that transformational leaders promote subordinates' intellectual growth and motivation (Bass, 1996). Given the role that the soldiers' social identification plays in effective performance (Shamir & Ben-Ari, 2000), the present study suggests an important practical application for increasing this identification. Although the causality of the demonstrated mediation effects still needs to be tested in more experimental and longitudinal designs, our results suggest that by concentrating on development of soldiers' emotional competences, commanders may be able to improve their identification with their unit and through that, their fighting capabilities and their general efficiency as soldiers. The mediation model helps to identify the key competences of emotional intelligence for military leaders: stress management and adaptation.

Future research should focus on testing the causal direction in the mediation model, as well as on testing the model in various military samples in various contexts, for example, in military operational area. Some limitations of this study should be mentioned. Because the research was conducted in a complex military hierarchy system, only rating data from subordinates were used for measuring leadership behavior instead of the transformational leadership MLQ 360 degree method suggested by Avolio and Bass (2007). It would be very useful to replicate our findings in a similar field context by using the 360 degree method of supervisor/peer/subordinate ratings.

The present study demonstrates the importance of investigation of soldiers' emotional intelligence and social identification connected to leadership behavior in the military. We suggest that military leaders can strengthen soldiers' social identification with their unit by teaching and developing the emotional intelligence skills of soldiers. Such studies are essential to understanding of the application of leadership theories in specific contexts and in improving of the leadership efficiency and training of leadership skills and emotional intelligence in the military.

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Scientific Concepts Test in Latvian and Russian language: Evidence for reliability and validity

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The purpose of the study was to determine the psychometric properties of newly developed Scientific Concepts Test-Latvian (SCT-L) and Scientific Concepts Test-Russian (SCT-R). These tests were developed as semantically equal forms for both Latvian and Russian samples; they contain identical concepts with phonologically different words. The Latvian sample consisted of 175 participants and Russian sample consisted of 101 participants. All respondents were between ages 14 and 16 (male – 49 %, female – 51%) were enrolled in 9th grade. The SCT-L and SCT-R contain two scales: the Humanities Concepts scale and the Natural Science Concepts scale which contribute to the total score (26 items). Spearman-Brown split-test reliability estimates are suitably high for both scales within both tests. Their concurrent and convergent validity was established using WISC-IV Vocabulary subtest in Latvian (Wechsler, 2003; Raščevska, Sebre, & Ozola, 2011, in print) and the Latvian Vocabulary test and the Russian Vocabulary test (Turilova-Miščenko, 2011).

***Key words*:** comprehension, scientific concept, reliability, validity.

Introduction

Latvian and Russian languages are commonly used throughout Latvia. Latvian is the official state language, and Russian is the native language of a large minority within the community. The community supports separate schools for children whose native language is Latvian or Russian. The education curriculum in the Russian minority school system is bilingual, i.e. instruction is presented in the Russian language and the Latvian language is offered as a second language. Latvian is introduced progressively from primary school through the 9th grade, with the average proportion of instruction in 9th grade being about 40% and 60% in Russian and in Latvian respectively. The Russian language is the dominant means of communication for native Russian students at home with family and friends as well as at school with classmates and even with teachers. This situation requires the development of tests in both languages.

Verbal comprehension is the ability to perceive and comprehend linguistic units (Stenberg, 2006). Comprehension includes such core language aspects as phonology, syntax, and semantics. Comprehension is also based on mental representations and depends on knowledge organization skills (Rosch, 1975; Rosch & Mervis, 1975). Verbal comprehension is a widely utilised in the disciplines of linguistics, philosophy, and psychology. However, in psychology, the term comprehension is better understood with

regard to tests and is measured by the evaluation of various tasks (Stenberg & Powell, 1983) such as when assessing vocabulary, reading, reasoning with verbal stimuli, information, and in the comprehension of social situations. Vocabulary typically is employed in the assessment of verbal comprehension. The study of vocabulary breadth and depth of scope is essential in the assessment of complex comprehension tasks (e.g. reading comprehension) (Ouellette, 2006; Kyle & Harris, 2010). Thus, an assessment of scientific concepts vocabulary is appropriate for the evaluation of student comprehension of scientific concepts. Widely implemented assessable vocabulary tasks include word recognition using pictures, picture recognition using word/s, naming synonyms and antonyms, and defining concepts (Dunn & Dunn, 1959, as cited in Ukrainetz & Duncan, 2000; Salthouse, 1993, as cited in Bowles & Salthouse, 2008; Wechsler, 1991; Wechsler, 2003). The concept defining task is more appropriate for scientific concepts comprehension assessment among adolescents.

A review of existing tests reveals that, in general, there are two test types that are used most commonly for the measurement of student scientific knowledge. The final examination test focuses on the resultant acquired knowledge of subject content that has been studied, e.g. the final test in mathematics for 9th grade in Latvia (Noteikumi par centralizēto eksāmenu, 2011). In contrast, other tests focus on the general skills needed by students for studying (i.e. Woodcock-Johnson III Test of Achievement – Woodcock, McGrew, & Mather, 2001). While neither of these tests types includes a vocabulary component, vocabulary is integrated into the test tasks in ways that prevent their direct measurement.

The development of one test that could be used simultaneously in parallel forms in at least two languages is needed in Latvia. This practice could help avoid the various known biases connected with test adaptation (ITC Guidelines for translating and adapting tests, 2010; Tanzer & Sim, 1999). The Scientific Concept Test is the first instrument that has been developed with semantically equal forms in both the Latvian and Russian languages.

Establishing validity of the Scientific Concepts Test-Latvian and Scientific Concepts Test-Russian

The target population for the tests involve adolescents (aged 14-16) with Latvian and Russian as their respective native languages. The Scientific Concepts Test-Latvian (SCT-L) and the Scientific Concepts Test-Russian (SCT-R) incorporate concepts from the following four scientific disciplines: history (e.g. "society"), mathematics (e.g. "secant"), biology (e.g. "joint") and language/literature (e.g. "story"). These scientific disciplines are in accord with Latvian Primary Education Standard 9th grade subject areas (LR Izglītības Ministrija, 2008).

The Natural Science Concepts Scale consists of concepts taken from biology and mathematics, and the Humanities Concepts Scale consists of concepts taken from history and language/literature. General comprehension of scientific concepts is reflected by the total score. Social science concepts and issues were not included in these tests since their role in the 9th grade education programme was not considered applicable to this particular study.

The initial item pool of 52 items was compiled on the basis of expert recommendations from 9th grade teachers of Latvian and Russian students in the subject areas of history, literature, native language, mathematics and biology. Initial item pool included more items than the final version of the tests (Kline, 2000). Items were retained in the tests that appeared in both languages and were taken from the expert listings that matched true criteria – that the items in both languages had to be similar semantically, that they had to have a different phonology and that they were represented by one word. In the empirical study items were selected to represent increased difficulty levels and appropriate discrimination indices. Item analysis according to item response theory was used (Birnbaum, 1968; Hambleton & Swaminathan, 2010). The reliability of the scales was verified by the Spearman-Brown split-test reliability measure (Kline, 2000).

The use of the WISC-IV Vocabulary subtest in Latvian (the validation of this test has not been done in Russian) (Wechsler, 2003; Raščevska & Sebre, 2011, in print) and the Latvian and Russian versions of the Vocabulary test (Turilova-Miščenko, 2011) were found to be appropriate to verify the concurrent and convergent validities of the SCT-L and SCT-R. The afore-mentioned instruments measure the overall comprehension of the concepts. Moderate level correlations with the Scientific Concepts tests were expected.

The research examined the extent to which psychometric properties of both the SCT-L and the SCT-R met validity and reliability standards (Standards of Educational and Psychological Testing, 1999; Kline, 2000).

Method

Participants

The Latvian sample consisted of 175 pupils for whom Latvian was the native language and who were aged 14 through 16 years (M = 15.10, SD = 0.50) and in 9th grade. Forty nine percent of the sample were boys. Sixty five percent came from Riga and 35% from other Latvian cities.

Subsamples from the Latvian sample were used for verifying SCT-L validity: (a) 22 respondents aged 14 through 16 years (M = 15.50, SD = 0.96, 50% boys, 50% girls) completed WISC-IV Vocabulary subtest, b) 66 respondents aged 14 through 16 years (M = 15.06, SD = 0.49, 49% boys, 51 girls) completed the Latvian Vocabulary test (LVT).

The Russian sample consisted of 101 pupils from various schools in Riga for whom Russian was their native language and who were likewise aged 14 through 16 years (M = 15.12, SD = 0.48) and in 9th grade. Fifty one percent of the sample were boys.

Subsamples from Russian sample were used for verifying SCT-R validity: 51 respondents aged 14 through 16 years (M = 15.12, SD = 0.52, 55 % boys, 45% girls) completed the Russian Vocabulary test (RVT).

Measures

Both the SCT-L and SCT-R were developed in order to measure verbal comprehension of scientific concepts. Although the initial set consisted of 52 items in each test, however, the number of items was eventually reduced to 26 based on item data. Both versions of

the tests were identical in content yet had a different phonological sound, e.g. "segment" has similar meaning in Latvian and in Russian, but sounds different. The respondent's task was to define the terms. The following scoring system was used in the tests: 2 points were given if the answer was correct and the key words were mentioned; 1 point was given if only one key word was mentioned, a concrete example was given, or if the answer was partly correct; 0 point was given if the answer was incorrect.

The Latvian Vocabulary Test (LVT) and the Russian Vocabulary Test (RVT) were developed in the context of a dissertation (Turilova-Miščenko, 2011) with the aim to compare pupils' verbal comprehension in different languages (Latvian and Russion) from schools with bilingual program. Items and examples of evaluation are found in Appendix 1. Both tests included widely used concepts taken from everyday life (e.g. "to wash", "book") with the task being to provide the definition of these concepts. Each test consisted of 19 items. Both the Latvian and Russian versions contain identical concepts. The following scoring system was used in the tests: 2 points were given if the answer was correct and the key words were mentioned; 1 point was given if only one key word was mentioned, a concrete example was given, or the answer was partly correct; 0 point was given if the answer was incorrect. The Spearman-Brown split-test reliability index of the LVT was .73; the Spearman-Brown split-test reliability index of the RVT was .68.

The WISC-IV Vocabulary subtest Latvian version (Wechsler, 2003; Raščevska, Sebre, & Ozola, 2011, in print) was used in order to verify the validity of the SCT-L. WISC-IV item assessment principles were applied to evaluate the items in the Latvian version.

Procedure

State supported secondary schools participated in the study. With permission from the school administration and their parents, students in the 9th grade were asked to participate in the study. Those who agreed and whose primary requirement was either native Latvian or Russian then were tested. The maximum number of students tested at any time was 10 in the Russian group and six in the Latvian group.

Both Latvian and Russian groups completed the tests either in writing or by oral response. Among the Latvian sample 13 % of participants (M = 22.96, SD = 7.84) completed the test in writing while 87% completed the test orally (M = 22.41, SD = 8.77). There were no significant differences between participants who completed the test in writing or orally (t (176) = .28, $p > .05$). Among the Russian sample, 33 % of participants (M = 25.47, SD = 9.95) completed the test in writing and 67% completed the test orally (M = 25.15, SD = 8.58). There were also no significant differences between participants who completed test in writing or orally (t (99) = .17, $p > .05$).

The written response form was used in the pilot study and since no statistically significant differences were found, it was decided to include respondents who completed the written test into the analysis.

Data collection for both language versions of the tests was undertaken simultaneously. Two experts undertook the evaluation of participant SCT-L, SCT-R, LVT and RVT responses. At first, a common evaluation procedure was developed and then each expert independently evaluated the data. Then these evaluations were compared and any difficult issues were discussed and resolved. Identical evaluation criteria were applied

for both the Latvian and Russian versions of the test. Identical answers in Latvian and Russian versions were scored similarly.

Results

Data analysis took place in several stages. During the first stage, several concepts were omitted because the respondents indicated (i) a different semantic understanding of these concepts (e.g."cunfte" stands for "craftsmen's union" in Latvian; however, in Russian, this concept has several meanings: "craftsmen's union", "place where something is manufactured", with the most common being the second meaning); and (ii) there were some differences in the difficulty of explaining the various concept (e.g. for some items a synonym was easily to found in one language and not in the other). Furthermore, the indices of item difficulty and discrimination (calculated as corrected item-total correlation in the SPSS program 18 version) were analyzed. The final set of items included only those that have similar indices in both language test versions and that met psychometric criteria. Thus, tests with equal content and similar psychometric indices were established, resulting in 26 of the original 52 items. The Spearman-Brown split-test reliability coefficient was verified for both tests, and the concurrent and convergent validities were defined. The SCT-L and the SCT-R each have two scales, the Humanities Concepts Scale and the Natural Science Concepts Scale, that were established based on content validity, not on factorial validity.

The principal components analysis of the SCT-L 26 items and the SCT-R 26 items was performed separetaly and yielded eight components, each not two - the Humanities concepts component and Natural science concepts component, explaining 56% of the total variance for SCT-L and 63% of the total variance for SCT-R. The logically combined scale using sums of Humanities Concepts items and the scale of Natural Science Concepts items forms one component in both tests versions which explains 87.09% of the total item variance, the determinant is .45, the KMO measure is .50, and the Bartlett test is significant in that χ^2 (1) = 220.92 ($p < .001$) for SCT-L, and explains 87.80 % of the total item variance, the determinant is more than .43, the KMO measure is .50, and the Bartlett test is significant in that χ^2 (1) = 83.44 ($p < .001$) for SCT-R.

Test item analysis

The difficulty and discrimination indices of both tests satisfied the accepted psychometric criteria (see Table 1). The SCT-L and SCT-R also included items that ranged from easy to difficult – a desired quality in measures of cognition exceeding the difficulty indices range from .40 to 1.60, an acceptable level for tests with two-score evaluations. The mean level of item difficulty indicates that, in general, the items had an average difficulty level.

The items were analysed according to the principles of the item response theory. Respondents who had low scores in test total score had lower difficulty indices in both the SCT-L and the SCT-R items when compared with the respondents who attained medium to high scores in their test total score. Conversely, respondents who had high scores in test total score had higher difficulty indices for items compared with the respondents with medium and low scores in their test total score.

Table 1. **Item difficulty and discrimination indices of SCT-L and SCT-R**

Scale and item	*SCT-L*			*SCT-R*		
	Difficulty index (M)	*SD*	*Discrimination index**	*Difficulty index (M)*	*SD*	*Discrimination index**
Natural science concepts scale (total)	*12.63*	*5.44*	-	*13.89*	*5.35*	-
Segment	1.46	0.80	.43	1.38	0.83	.33
Stomach	1.36	0.71	.50	1.50	0.66	.24
Triangle	1.29	0.81	.42	1.74	0.56	.32
Joint	1.11	0.75	.45	0.93	0.86	.54
Reproduction	1.09	0.85	.38	1.30	0.82	.50
Development	0.94	0.52	.30	0.88	0.67	.42
Cell	0.89	0.78	.40	0.93	0.79	.62
Breathing	0.87	0.70	.36	1.01	0.75	.36
Area	0.77	0.90	.36	0.67	0.66	.55
Tangent line	0.74	0.91	.52	0.66	0.83	.39
Plant	0.68	0.62	.38	10.02	0.69	.31
Angle	0.67	0.74	.47	0.70	0.61	.26
Secant line	0.41	0.76	.33	0.63	0.83	.47
Equation	0.37	0.58	.37	0.52	0.58	.47
Item mean	*0.90*	*0.74*	*.41*	*0.99*	*0.73*	*.41*
Humanities concepts scale (total)	9.85	3.82	–	11.27	4.27	-
Monument	1.66	0.54	.24	1.54	0.59	.24
Society	1.35	0.68	.34	1.04	0.47	.23
War	0.99	0.56	.38	1.16	0.52	.41
Sentence	0.99	0.69	.38	1.14	0.69	.43
Discription	0.99	0.76	.46	0.98	0.77	.30
Slavery	0.92	0.55	.35	1.34	0.52	.20
Story	0.88	0.64	.37	1.00	0.68	.45
Pronoun	0.59	0.67	.26	0.87	0.83	.37
Personification	0.56	0.76	.32	0.61	0.73	.33
Serf ownership	0.45	0.74	.43	0.59	0.85	.54
Priesthood	0.30	0.59	.24	0.23	0.56	.35
Nobility	0.16	0.45	.27	0.84	0.85	.47
Item mean	*0.82*	*0.64*	*.34*	*0.95*	*0.66*	*.36*

SCT-L – Latvian version of Scientific concepts test

SCT-R – Russian version of Scientific concepts test

*Calculated as Corrected Item-Total Correlation by SPSS 18. Version

Reliability

The reliability of the SCT-L and the SCT-R scales was verified by the Spearman-Brown split-half test reliability coefficient. All reliability indices of the scales were acceptably high and above .80, except for the SCT-L Humanities Concepts Scale, in which the Spearmen-Brown split-test reliability was .73. The Spearmen-Brown split-test reliability for the SCT-L Natural Science Concepts Scale was .81 and for total score was .83. The Spearmen-Brown split-test reliability indices for the SCT-R Humanities Concepts Scale, Natural Science Concepts Scale and Full scale were .82, and .81 and .86 respectively.

Thus, the SCT-L and the SCT-R both consist of 26 items that form three scales: the Humanities Concepts Scale ($k = 12$), the Natural Science Concepts Scale ($k = 14$) and the Full scale ($n = 26$). The reliability indices for both tests were acceptably high.

Concurrent and Convergent Validity

Concurrent and convergent validity estimates of the SCT-L were verified using the WISC-IV Vocabulary subtest and the LVT. The SCT-L scales showed a significant positive correlation with the WISC-IV Vocabulary for the Humanities Concepts Scale ($r = .58$; $p < .01$) and the Natural Science Concepts Scale ($r = .51$; $p < .05$) as well as with the SCT-L total score ($r = .71$; $p < .01$). The SCT-L also showed a significant positive correlation with the LVT for the Humanities Concepts Scale ($r = .61$; $p < .01$) and the Natural Science Concepts scale ($r = .73$; $p < .01$) as well as with the SCT-L total score ($r = .71$; $p < .01$).

Concurrent and convergent validity estimates of the SCT-R were verified using the RVT. The SCT-L showed a significant positive correlation with the RVT for the Humanities Concepts Scale ($r = .53$; $p < .01$) and the Natural Science Concepts Scale ($r = .48$; $p < .05$) as well as with the SCT-R total score ($r = .53$; $p < .01$).

Discussion

The item difficulty and discrimination indices or the SCT-L and SCT-R psychometric indices satisfy psychometric criteria (Standards of Educational and Psychological Testing, 1999; Kline, 2000). However, the mean difficulty values for SCT-L items were lower than the mean difficulty values for SCT-R items, thus suggesting that the Latvian version of the test was more difficult than the Russian version. The content validity was verified, and semantic similarity had been achieved. The number of respondents was sufficiently high ($n = 178$ for SCT-L, $n = 101$ for SCT-R) and the mean values of the discrimination indices for both test versions were similar. The mean differences on the difficulty indices of items may be due to some external factors not controlled in the research procedure such as the respondents' differences in the level of their knowledge.

The Spearman-Brown split-half test reliability indices for the SCT-L and the SCT-R scales satisfied the psychometric criteria. However, reliability estimates for the SCT-L Humanities Concepts Science Scale was only .73. This may be due to the lack of items in the difficulty range between .99 to 1.35 (between the items "society" and "war") (see Table 1). There were also three items with an equal difficulty index of .99 ("war", "sentence", "description") within the SCT-L Humanities Concepts Science Scale. Therefore, those items that had equal difficulty could be omitted. However, these items were retained because of other influential factors, including the following: (a) the items represent

different scientific disciplines, e.g. "war" – History, "sentence" and "description" – Language/Literature; (b) since the SCT-L and the SCT-R were developed simultaneously, one could not omit certain items from one version and leave them in the other. Similar problems were not found in the SCT-R Humanities Concepts Scale.

It is likely that the component analysis did not confirm the two component structure for the Latvian and Russian test items because the test items represent the different themes in the subject matter. Further research is needed to explain why items that represent different themes within Humanities or Natural science do not form closer conceptual relationships.

The WISC-IV Vocabulary subtest in Latvian was used with the SCT-L and was not used with the SCT-R as it had not been adapted for use in Russian. Two additional tests were employed to verify the validities: the Latvian Vocabulary Test (LVT) and the Russian Vocabulary Test (RVT). Thus, concurrent and convergent validities were estimated.

Limitations

Further work with the SCT-L and the SCT-R tests may be warranted. For example, the collection of data on a broader representative sample, including samples matched for city and rural areas, as well as samples from a wider respondent age range. Further analysis of possible gender effect would be desirable to undertake.

Efforts to verify the test-retest reliability also are warranted. Although the addition of items in each scale may be helpful, this goal may be difficult to achieve because of the limited amount of items which are considered valid for the scale itself and which are sufficiently phonologically different in the Latvian and Russian languages. Future research also could examine the issues of predictive validity (i.e. employing information from the school achievement index for the 9th grade), divergent validity and clinical validity.

In summary, the primary goal of this study has been achieved, i.e. a reliable and valid instrument for measuring scientific concepts comprehension among 9th grade students has been developed in both the Latvian and Russian languages.

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Appendix 1. **The items of the Latvian and Russian version of Vocabulary test**

Nr.	*Latvian version of Vocabulary test (LVT)*	*Russian version of Vocabulary test (RVT)*	*Items in English (translated not adapted)*
1	Rūpēties	Заботиться	to take care
2	Celtnieks	Строитель	Builder
3	Godīgs	Честный	Honest
4	Dusmīgs	Сердитый	Angry
5	Pacelt	Поднять	to pick up
6	Izstrādājums	Изделие	Product
7	Dziesma	Песня	Song
8	Mazgāt	Мыть	to wash
9	Griesti	Потолок	Ceiling
10	Sadzīve	Быт	Social life
11	Sildīt	Греть	to warm
12	Kautrīgs	Робкий	Shy
13	Censties	Стараться	to try
14	Lasīt	Читать	to read
15	Grāmata	Книга	Book

Evaluation example: item „song"
2 scores – melody with words; text to sing with the music;
1 score – music; words spoken poetically;
0 score – sound from the mouth of man; rhythm of life.

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The association of cognitive abilities, emotional intelligence, defense mechanisms and coping with employment and unemployment

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The aim of this study is to clarify the extent to which cognitive ability, emotional intelligence, coping and psychological defense mechanisms predict unemployed status. Five instruments were used: Woodcock-Johnson Tests of Cognitive Abilities International Edition (WJ-IE) Latvian version; Bar-On Emotional Quotient Inventory (EQ); Strategic Approach to Coping Scales (SACS); Defense Style Questionnaire (DSQ), and Life Style Index (LSI). Data were collected from two groups equated on demographic indicators (gender, age, education level): 115 unemployed and 115 employed participants ranging in age from 18 to 55 years (14.8 % male, 85.2 % female, mean age M = 27.81, SD =7.01). The logistic regression analysis showed that the following variables predict employment status: Adaptive defense style, Self-sacrifice style, Regression, Instinctive action, Indirect action, Intrapersonal factor, and General Mood factor.

Key words: cognitive ability, emotional intelligence, defense mechanisms, coping, unemployment.

Introduction

Psychological research has attempted to answer the question: What characteristics increase the likelihood of unemployment. Unemployment in Latvia in 2011 was 14.6%. However, from 2006 to 2008, the unemployed rates fluctuated from 4.5 % to 8 % and the choice of job vacancies was broad. Therefore, the probability of an individual becoming unemployed and his/her subsequent search for work may be related to the economic situation, as well as an individual's personal traits.

Most research on the unemployed focuses on mental health issues associated with unemployment (McKee-Ryan, Wanberg, Song, & Kinicki, 2005). Research data on the unemployed shows poorer mental health and more signs of psychological distress when compared to those who are employed (Paul & Moser, 2006). The research on long-term unemployment shows that the most important determinants of unemployment are previous work experience, age, region, marital status and to a lesser extent education (Alhawarin & Kreishan, 2010). However, the question why people are unemployed is not easily answered. For example, a study of voluntary and involuntary unemployment showed that unemployment impacts different individuals in different ways (Chadi, 2010). A considerable number of unemployed individuals do not intend to work and therefore unemployment has a relatively small impact on their well-being. Most of these unemployed are over age 50, some are unable to work or have lost confidence in returning to employment (Chadi, 2010).

Cognitive Ability

One's intelligence provides the basis for successful adaptation to the environment, including occupational activity. Intelligence is relates to purposeful activity to flexibly and efficiently adapt to the environment (Sternberg & Detterman, 1986). During the 1980s and 1990s, new intelligence tests have been developed consistent with contemporary research and theoretical models of the structure of cognitive abilities. One such instrument is the Woodcock-Johnson Tests of Cognitive Abilities (WJ-IE) (Woodcock, McGrew, & Mather, 2001) which measures verbal abilities, thinking abilities, cognitive efficiencies and general intellectual abilities (Woodcock, 1990). The Latvian version of the international edition of WJ-IE test is also used in this research. Several studies noted that intelligence influences a person's everyday competence (Gottfredson, 1997) and it is one of the factors related to career growth (Dunn, Mount, & Barrick, 1995; Gottfredson, 2002). Employees with a higher general intellectual ability are better educated and advance more rapidly up the career ladder, thus indirectly indicating an interconnection between cognitive intelligence and employment status. One can assume that those who are less intelligent and do not achieve a successful job career are more liable to lose their job. Similar findings were noted by Fergusson and their colleagues (Fergusson, Horvood, & Ridder, 2005). Intelligence, when measured in children, and their future socio-economic indicators in adulthood, predicted the length of unemployment over a longer period.

Emotional Intelligence

Since the 1980s, several new theories that use the term of intelligence have appeared (e.g. emotional intelligence). Emotional intelligence is thought to predict a person's social relationships (Mayer & Salovey, 1997; Bar-On, 1999, 2001). The emotional intelligence model of Mayer, Salovey and Caruso, called the ability model, includes the abilities that provide adequate experience, perception, understanding, expression and control of emotions (Mayer, Salovey, 1997; Mayer, Salovey, & Caruso, 2000). People with higher emotional intelligence are thought to be more socially efficient than those who display lower emotional intelligence (Mayer & Salovey, 1997). Two other emotional intelligence models called mixed models have defined emotional intelligence as self-awareness, impulse control, persistence, diligence, motivation, social skills and empathy or as a composite of cognitive and non-cognitive factors – intrapersonal, interpersonal skills, adaptation, stress management and general mood (Bar-On, 1999; Goleman, 1995). Emotional intelligence predicts success in different areas of life, including academic achievements (Ross & Powell, 2002; Lift, 2003). Carmeli, Yitzhak and Weisberg (Carmeli, Yitzhak-Haley, & Weisberg, 2009) have found a positive relationship between emotional intelligence and some well-being indicators, for example, self-contentment and satisfaction with life. Findings of Bar-On's model also show that emotional intelligence has a significant impact on successful performance, happiness, well-being and search for a more meaningful life, which are important topics of study in the field of positive psychology (Seligman & Csikszentmihalyi, 2000, as indicated by Bar-On, 2010). Thus, people with higher emotional intelligence are expected to display more effective coping strategies.

Coping strategy

Coping strategies used in situations of psychological, physical, personal and social danger and coping depend on both a subjective danger assessment, and assessment of coping possibilities (Lazarus & Folkman, 1984). Lazarus particularly emphasizes the importance of emotions in the adaptation process (Lazarus & Folkman, 1984). Coping strategies are considered a potential modifier of the impact of unemployment on health and well-being and coping efforts may consist of strategies aimed at changing the stressful situation for the better *(*Christensen, Schmidt, Kriegbaum, Hougaard, & Holsten, 2006). Also, coping is related to social level/status (Drageset & Lindstrom, 2005), influence a person's employment search activities (Caplan, Vinokur, Price, & Ryn, 1989). It has been established that the *unemployed persons* have low problem solving coping, also differences in coping strategies with unemployment were associated with educational achievement (Christensen & Holsten, 2006).

A thorough analysis of the two concepts led to the conclusion that defense and coping are psychological processes that do not differ in their outcome (Cramer, 1998). Cramer (1998) proposed that coping actions entail conscious processes whereas defenses operate behind the person's awareness. Coping involves the organization and integration of the person's accumulated experience and available resources, while defenses, by contrast reduce subjective distress (Hentschel, Draguns, & Smith, 2004).

Psychological defense mechanisms

Psychological defense mechanisms are characterized as being unconscious, and the development and use of these mechanisms result from the individual's need to protect themselves against anxiety. Psychological defenses have been described in terms of four levels as: I – narcissistic, II – immature, III – neurotic, IV – mature level (Vaillant, 1977). Nowadays, such divisions are widely used in the psychotherapy and also in this research.

Psychological defense mechanisms are investigated mainly in relation to various personality disorders, depression, anxiety disorders, eating disorders, trauma and dissociation (Bond, 2004). Persons who display mature psychological defense mechanisms also generally display better psychological health, psychological maturity, higher work capacity, and life satisfaction (Vaillant & Vaillant, 1992). Although prior research has not investigated psychological defense mechanisms in groups of the unemployed persons, other research indirectly supports the idea that unemployed individuals may display less mature psychological defense mechanisms compared to employed persons.

One's intelligence is associated with the maturity level of one's psychological defenses (Vaillant, 1993). Emotional intelligence also is associated with psychological defense mechanisms, and intelligence (Pellitteri, 2002). Pellitteri's research measures of the adaptive defense style scale positively correlated with the Emotional understanding scale, while the Maladaptive defense style scale negatively correlated with the Emotional understanding scale and B (intelligence) scale (Cattel's 16 Personality Factor Questionnaire).

Intrapersonal and interpersonal qualities reflected in emotional intelligence correlate with active coping strategies (David, 2008). Similarly problem-focused coping

styles correlate with the EQ interpersonal and adaptability factor (Alumran & Punamaki, 2008). The support search style of coping correlated with almost all emotional intelligence factors except stress management and intrapersonal factor. However, the non-productive coping style (i.e. when a person tends to blame others, to perceive the desirable as existing and to avoid solving of problems) correlates modestly with three EQ scales: stress management factor, interpersonal factor and total emotional intelligence.

Some studies show that the concepts of analytical intelligence, emotional intelligence, coping strategies and psychological defenses are related and research that incorporates all these categories in a mutual interconnection attempts to answer the question as to which of these most strongly predicts the employed status of a person. Therefore the research objective is to clarify whether: Who are and who are not employed display differences in cognitive abilities, emotional intelligence, coping and psychological defenses; and the degree to which cognitive abilities, emotional intelligence, coping and psychological defenses predict unemployed/employed status.

Method

Participants

Participants include of 230 individuals, ages 18 – 55 (mean age M = 27.92, SD = 6.66). The group of employed persons included 115 (14.8 % male, 85.2 % female, mean age M = 27.81, SD = 7.01) while the group of unemployed persons included 115 (14.8 % male, 85.2% female, mean age M = 28.04, SD = 6.32) which have not been employed for at least 6 months. Participants assigned to either the employed or unemployed group were equated by gender, age, education, and marital status. Their education: incomplete secondary education – 4%, vocational education – 21.7%, employed and unemployed undergraduate students– 41.7% , higher education – 32.6%. Marital status: married – 49.1%, divorced – 5.7%, unmarried – 45.2%, and about 35% live in the Riga, but about 65% in another region of Latvia. All the unemployed were registered with the State Employment Agency, Latvia.

Measures

The Woodcock-Johnson Tests of Cognitive Abilities, International Edition, Latvian version (WJ-IE COG). Woodcock-Johnson III: Tests of Cognitive Abilities were adapted in Latvia in cooperation with the Woodcock-Munoz Foundation (Ruef, Furman, & Munoz-Sandoval, 2005; Rascevska & Upzare, 2001). WJ-IE COG measures 3 clusters of cognitive abilities: Verbal ability (Vocabulary; Synonym/ Antonym, and Verbal analogy), Thinking ability (Memory for names; Spatial relations; Quantitative reasoning), and Cognitive efficiency (Visual matching; Numbers reversed) and the scale of General intellectual ability. Reliability analyses of the WJ-IE COG have yielded Cronbach alphas in the .88 to .95 (Griskevica, 2011). The Cronbach alpha in the present study was .79 to .82.

Bar-On Emotional Quotient Inventory (EQ-i): This inventory was published originally in Canada (Bar-On, 1999), has been adapted in Latvia (Gaitniece-Putane & Rascevska, 2006; Gaitniece-Putane, 2008; Malzubris, 2003). The inventory includes 133 items and six scales: Intrapersonal, Interpersonal, Adaptation, Stress management, General mood,

and EQ-I total scale. The items are scored on a 5-point Likert-type scale, ranging from „never or very seldom refers to me," to „very often or always refers to me". Reliability analyses of the EQ have yielded Cronbach alphas ranging from .81 to .94 (Gaitniece-Putane, 2008). The Cronbach alphas in the present study ranged from .71 to .87.

Defense Style Questionnaire (DSQ) (Bond & Wesley, 1996). The questionnaire consists of 88 questions and measures 4 defense styles: Maladaptive style, Image-distorting style, Self-sacrifice style and Adaptive style. The items are scored on a 7-point Likert-type scale. In previous research, internal consistency analyses have yielded Cronbach's alphas in the range of .57 to .87 for the four defense styles (Nishimura, 1998; Plaude & Rascevska, 2008; Sammallahti & Aalberg, 1995). In the present study, internal consistencies (Cronbach's alpha) for the Maladaptive style, Image-distorting style, Self-sacrifice style and Adaptive style, respectively, were .86, .82, .69, .70.

Life Style Index (LSI) (Plutchik, 2000). This questionnaire consists of 97 statements and measures 8 defense mechanisms to be evaluated by "I agree", "I do not agree". Reliability analyses of the LSI (Denial, Regression, Compensation, Intellectualization, Reaction formation, Repression, Projection, and Displacement) have yielded Cronbach's alphas in the .54 to .86.range (Plutchik 2000). The Cronbach's alphas in the present study ranged from .58 to .81.

Strategic Approach to Coping Scales (SACS) (Hobfoll, Dunahoo, & Monnier, 1998). The questionnaire consists of 52 statements and comprises 9 subscales: Persistent action, Avoidance, Seeking social support, Cautious action, Social joining, Instinctive action, Aggressive action, Antisocial action and Indirect action. The items are rated on a 5-point Likert-type scale. Reliability analyses of the SACS have yielded Cronbach's alphas ranging from .67 to .90 (Hobfoll, Dunahoo, & Monnier, 1998). The Cronbach's alphas in the present study ranged from .59 to .65.

Procedure

Data on cognitive ability were collected by testing each respondent individually. Data on other qualities were collected in the groups of 5-15 people. All participants were utilizing the national employment service at the time at which they were surveyed. There was no time limit for completing the survey. Participation in the test and filling-out of the questionnaires were organized on a voluntary basis.

Data analyses

Data were analyzed with: t–tests, biserial and Pearson correlations and binary logistic regression analyses (forward conditional), using the SPSS 17 version.

Results

As seen in Table 1, there are several significant differences: 1) the unemployed have lower general intellectual ability and lower verbal intellectual ability than employed; 2) the unemployed have higher interpersonal and general mood qualities and lower intrapersonal qualities; 3) the unemployed display higher levels on three defense styles – maladaptive style, image-distorting style, and self-sacrifice style, and higher life styles – denial, regression, reaction formation, projection, displacement, and a lower adaptive

style. The unemployed display higher levels of the coping scales: persistent action, avoidance, cautious action, and instinctive section, and a lower level of indirect action.

Table 1. **Descriptive statistics, t-tests and reliability for measures of Cognitive abilities, Emotional intelligence, Defense styles, Life styles, Coping for the unemployed and employed group**

Scales	r_{bis} *with employ-ment status*	*Unemployed M (SD)*	*Employed M (SD)*	*t*
Cognitive abilities (WJ-IE)				
Verbal ability	.50**	532.57 (10.48)	542.68 (12.36)	-6.68**
Thinking ability	.03	511.59 (6.38)	512.10 (6.93)	-0.58
Cognitive efficiency	.02	268.03 (5.84)	268.50 (5.74)	-0.60
General intellectual ability	.26**	526.74 (7.05)	530.59 (7.17)	-4.10**
Emotional intelligence (EQ)				
Intrapersonal skills	.15*	121.37 (21.36)	127.40 (19.79)	-2.22*
Interpersonal skills	-.20**	105.94 (10.22)	101.34 (12.75)	3.02**
Adaptability scales	.07	80.95 (11.58)	82.68 (12.81)	-1.07
Stress-Managements Scales	.01	55.03 (8.41)	55.26 (9.89)	0.19
General mood	-.33**	62.66 (6.49)	57.24 (8.98)	5.25**
Emotional intelligence (total)	-.02	425.98 (46.09)	423.94 (55.72)	0.30
Defense style (DSQ)				
Maladaptive style	-.14*	48.84 (8.01)	45.43 (13.96)	2.11*
Image-distorting style	-.72**	51.19 (10.34)	33.46 (6.25)	15.72**
Self-sacrifice style	-.45**	38.24 (7.13)	31.31 (5.87)	7.67**
Adaptive style	.21*	39.82 (6.84)	42.90 (7.74)	-3.27*
Life Style Index (LSI)				
Denial	-.40**	6.67 (3.20)	4.25 (2.37)	6.52**
Regression	-.45**	6.53 (2.85)	4.02 (2.15)	7.51**
Compensation	.02	3.66 (1.87)	3.71 (1.53)	-0.23
Intellectualization	.12	4.81 (1.69)	5.33 (2.64)	-1.78
Reaction formation	-.48**	5.04 (2.52)	2.60 (1.95)	8.17**
Repression	.02	2. 04 (1.78)	2.51 (1.87)	-0.29
Projection	-.13*	6.03 (1.85)	5.46 (2.38)	2.04*
Displacement	-.27**	4.77 (3.15)	3.35 (1.62)	4.28**
Coping (SACS)				
Persistent action	.14*	30.86 (4.83)	29.60 (3.97)	2.15*
Avoidance	.32**	18.20 (4.67)	15.34 (3.83)	5.07**
Seeking social support	.11	21.35 (4.27)	22.42 (5.06)	-1.73
Cautious action	.25**	16.86 (3.14)	15.06 (3.81)	3.90**
Social joining	.06	14.46 (3.07)	14.88 (3.68)	-0.95
Instinctive action	.38**	21.65 (3.66)	18.67 (3.60)	6.20**
Aggressive action	.11	12.61 (2.89)	13.29 (3.41)	-1.63
Antisocial action	-.05	12.21 (3.56)	11.84 (3.46)	0.81
Indirect action	.22**	9.57 (2.65)	10.84 (2.94)	-3.43**

*p<.05, **p<.01

Table 2. **Pearson correlations among Cognitive abilities, Emotional intelligence, Defense styles, Life styles and Coping scale (N=230)**

Scales	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
Cognitive abilities												
Verbal ability	-.21**	-.42**	-.24**	.19*	-.25**	-.33**	.02	.02	-.41**	-.06	-.16*	-.22**
Thinking ability	.21**	-.11	-.21**	-.02	-.01	-.09	.08	-.10	-.15*	-.06	-.18**	-.04
Cognitive efficiency	.05	-.09	-.12	.06	-.01	.01	.08	.01	.01	.07	.01	.05
General intellectual ability	-.03	-.32**	-.26**	.13	-.09	-.17*	.09	-.07	-.23**	-.05	-.18**	-.08
Emotional intelligence												
Intrapersonal skills	-.11	-.22**	-.14*	.12	-.25**	-.46**	-.11	.02	-.40**	-.12	-.18**	-.51**
Interpersonal skills	-.16*	.15*	.25**	.11	.16	-.02	.01	.16*	.11	-.04	.04	-.06
Adaptability scales	-.21**	-.14*	.01	.10	-.17*	-.40**	-.12	.13	-.32**	.05	-.07	-.44**
Stress-Management scales	-.10	-.04	-.06	.03	.03	-.22**	-.10	.15*	-.12	.03	-.08	-.23**
General mood	-.01	.26**	.24**	.10	.19**	-.05	-.08	.07	.02	-.09	-.09	-.09
Emotional intelligence (total)	-.15*	-.05	.03	.12	-.07	-.34**	-.10	.11	-.23**	-.06	-.11	-.38**
Coping scale (SACS)												
Persistent action	-.08	.13*	.13	.07	-.05	-.11	-.02	.05	.04	.00	-.-4	-.07
Avoidance	.12	.44**	.34**	.07	.51**	.46**	.18**	.02	.47**	.12	.13*	.55**
Seeking social support	-.10	-.11	.10	.25**	.01	-.07	.21**	.11	-.04	.13*	.08	.06
Cautious action	-.04	.25**	.23**	.15*	.30**	.20**	.15*	.26**	.37**	.24**	.14*	.21**
Social joining	-.13*	-.08	-.00	.18**	-.07	-.11	-.09	-.01	-.14*	-.10	-.09	-.25**
Instinctive action	.01	.42**	.30**	.06	.24**	.26**	-.01	.07	.29**	.11	.07	.27**
Aggressive action	-.14*	-.00	.05	.27**	.04	-.05	.02	.25**	-.09	.25**	.04	-.11
Antisocial action	-.07	.17*	.17*	.29**	.16*	-.00	-.00	.06	-.05	.16*	-.07	.02
Indirect action	-.11	-.11	-.01	.29**	.03	-.07	.06	.14*	-.15*	.08	-.01	-.12

**p< .01, *p< .05; 1 – Maladaptive style, 2 – Image-distorting style, 3 – Self-sacrifice style, 4 –Adaptive style; 5 – Denial, 6 – Regression, 7 –Compensation, 8 – Intellectualization, 9 – Reaction formation, 10– Repression, 11 – Projection, 12 – Displacement

Table 2a. **Pearson Correlations among Cognitive abilities, Emotional intelligence, Defense styles, Life styles and Coping scale (N=230)**

Scales	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Coping scale										
Persistent action	0.32**	0.31**	0.22**	0.20**	0.28**	0.34**	-0.06	-0.08	-0.03	-0.07
Avoidance	-0.27**	0.11	-0.15*	0.01	0.18**	-0.08	-0.17*	0.06	0.05	-0.05
Seeking social support	0.31**	0.27**	0.24**	0.09	0.18*	0.29**	0.21**	0.09	0.11	0.20**
Cautious action	0.09	0.36**	0.21**	0.13*	0.30**	0.24**	-0.09	0.06	0.07	0.00
Social action	0.35**	0.35**	0.29**	0.15*	0.25**	0.36**	0.13*	-0.07	-.06	0.02
Instinctive action	0.07	0.27**	0.07	0.14*	0.35**	0.19**	-0.29**	-0.03	-0.04	-.20**
Aggressive action	0.29**	0.19**	0.33**	0.19	0.24**	0.31	0.13	-0.07	-0.04	0.03
Antisocial action	0.09	0.06	0.13	0.03	0.21**	0.12	-0.01	-0.02	0.12	0.05
Indirect action	0.16*	0.05	0.15*	0.11	0.07	0.15*	0.12	-0.01	0.00	0.06
Cognitive Abilities										
Verbal Ability	0.14*	-0.10	0.11	-0.03	-0.20**	0.02				
Thinking Abiliy	0.03	-0.07	-0.03	0.00	-0.05	-0.02				
Cognitive Efficiency	0.00	-0.10	-0.07	-0.15*	-0.13*	-0.08				
General Intellectual Ability	0.09	-0.14*	0.02	-0.09	-0.20**	-0.04				

**p<.01, *p<.05;
1 – Intrapersonal skills, 2 – Interpersonal skills, 3 – Adaptability scales, 4 – Stress-Management scales, 5 – General Mood, 6 – Emotional intelligence (total), 7 – Verbal Ability, 8– Thinking Ability, 9 – Cognitive Efficiency, 10 – General Intellectual Ability

Biserial correlations between employment status and all personal variables are included in Table 1. As expected, employment status correlates significantly with almost all variables. The highest correlations were found for Verbal ability r = .50, General mood r = -.33, Image-distorting style r = -.72, Self-sacrifice style r = -.45, Denial = -.40, Regression = -.45, Reaction formation = -.48, and Avoidance = .32, p<.01. These variables displayed higher intercorrelations: e.g., the Image-distorting style and Verbal abilities (r = -.42), Avoidance and Reaction formation (r = .47), Displacement (r = .55) and Denial (r = .51) (see Table 2 and 2a).

Logistic regressions were performed to examine the relationship of the employed status with cognitive ability, emotional intelligence, coping, psychological defense. Employed status served as the dependent variable and cognitive ability, emotional intelligence, coping, psychological defense as independent variables. Several regression models were examined by excluding mutually highly correlated variables.

The analyze of multiple regression was used for the purpose to clarify which personal qualities, i.e. cognitive abilities, emotional intelligence, psychological defense mechanisms and coping predict the employed status. Both groups were matched by gender, age and education level. This paper has presented two binary logistic regression models. The first includes the highest expected number of variables including all constructs – cognitive abilities, emotional intelligence, defense mechanisms and coping (see Table 3). The second reports show the largest predictive effect of model (see Table 4).

Table 3. **Binary logistic regression analysis of the scales of Defense styles, Life styles, Coping scale, Emotional intelligence and Cognitive abilities by using the Forward Conditional method**
(N = 230)

Values	*B*	*S.E.*	*(Exp)B*	R^2 *(Coxe&Snell)*	R^2 *(Nagelkerke)*
Step 1				.25	.33
Verbal ability (IQ)	0.23**	0.03	1.26		
Constant	-13.13**	1.96	0.00		
Step 2				.33	.44
Self-sacrifice style (DSQ)	-0.13**	0.03	0.88		
Verbal ability (IQ)	0.20**	0.04	1.21		
Constant	-6.33**	2.34	0.00		
Step 3				.37	.49
Self-sacrifice style (DSQ)	-0.10**	0.03	0.91		
Reaction formation (LSI)	-0.27**	0.08	0.76		
Verbal ability (IQ)	0.17**	0.04	1.18		
Constant	-4.72*	2.40	0.01		
Step 4				.42	.55
Self-sacrifice style (DSQ)	-0.08**	0.03	0.92		
General mood (EQ)	-0.09**	0.02	0.91		
Reaction formation (LSI)	-0.35**	0.08	0.71		
Verbal ability (IQ)	0.17**	0.04	1.18		
Constant	0.10	2.77	1.10		

Values	*B*	*S.E.*	*(Exp)B*	R^2 *(Cox&Snell)*	R^2 *(Nagelkerke)*
Step 5				.45	.60
Self-sacrifice style (DSQ)	-0.11**	0.03	0.89		
Adaptive style (DSQ)	0.07**	0.02	1.07		
General mood (EQ)	-0.11**	0.02	0.89		
Reaction formation (LSI)	-0.34**	0.09	0.71		
Verbal ability (IQ)	0.14**	0.04	1.15		
Constant	-0.75	2.93	0.47		
Step 6				.47	.63
Self-sacrifice style (DSQ)	-0.13**	0.03	0.87		
Adaptive style (DSQ)	0.07**	0.02	1.07		
General mood (EQ)	-0.12**	0.03	0.89		
Reaction formation (LSI)	-0.38**	0.09	0.68		
Verbal ability (IQ)	0.19**	0.05	1.20		
Thinking ability (IQ)	-0.05**	0.02	0.95		
Constant	4.60**	3.57	124.20		
Step 7				.49	.65
Self-sacrifice style (DSQ)	-0.13**	0.03	0.88		
Adaptive style (DSQ)	0.08**	0.02	1.10		
General mood (EQ)	-0.10**	0.03	0.90		
Instinctive action (SACS)	-0.15**	0.06	0.86		
Reaction formation (LSI)	-0.37**	0.10	0.69		
Verbal ability (IQ)	0.18**	0.05	1.19		
Thinking ability (IQ)	-0.05**	0.02	0.95		
Constant	6.97**	3.82	1063.63		
Step 8				.51	.68
Self-sacrifice style (DSQ)	-0.14**	0.04	0.87		
Adaptive style (DSQ)	0.07**	0.03	1.07		
General mood (EQ)	-0.12**	0.03	0.89		
Instinctive action (SACS)	-0.18**	0.06	0.74		
Indirect action (SACS)	0.23**	0.08	1.25		
Reaction formation (LSI)	-0.37**	0.10	0.69		
Verbal ability (IQ)	0.17**	0.05	1.19		
Thinking ability (IQ)	-0.05**	0.02	0.95		
Constant	7.22**	3.89	1369.60		
Step 9				.53	.70
Self-sacrifice style (DSQ)	-0.13**	0.04	0.88		
Adaptive style (DSQ)	0.08**	0.03	1.08		
General mood (EQ)	-0.11**	0.03	0.89		
Instinctive action (SACS)	-0.20**	0.06	0.82		
Indirect action (SACS)	0.27**	0.09	1.31		
Reaction formation (LSI)	-0.30**	0.11	0.74		
Denial (LSI)	-0.24**	0.09	0.79		
Verbal ability (IQ)	0.17**	0.05	1.19		
Thinking ability (IQ)	-0.04*	0.02	0.96		
Constant	6.06	3.10	426.86		

Values	*B*	*S.E.*	*(Exp)B*	R^2 *(Coxe&Snell)*	R^2 *(Nagelkerke)*
Step 10				.54	.72
Self-sacrifice style (DSQ)	-0.12**	0.04	0.89		
Adaptive style (DSQ)	0.08**	0.03	1.07		
Stress-management Scales (IQ)	0.07*	0.03	1.07		
General mood (EQ)	-0.16**	0.04	0.85		
Instinctive action (SACS)	-0.21**	0.06	0.81		
Indirect action (SACS)	0.26**	0.10	1.30		
Reaction formation (LSI)	-0.32**	0.11	0.73		
Denial (LSI)	-0.25**	0.09	0.77		
Verbal ability (IQ)	0.18**	0.05	1.20		
Thinking ability (IQ)	-0.04**	0.02	0.96		
Constant	4.16**	4.11	64.08		
Step 11				.55	.73
Self-sacrifice style (DSQ)	-0.11**	0.04	0.90		
Adaptive style (DSQ)	0.07**	.03	1.07		
Stress-management Scales (IQ)	0.06**	0.03	1.06		
General mood (EQ)	-0.15**	0.04	0.86		
Intellectualization (LSI)	0.24*	0.12	1.27		
Instinctive action (SACS)	-0.22**	0.06	0.80		
Indirect action (SACS)	0.25**	0.09	1.29		
Reaction formation (LSI)	-0.37**	0.12	0.69		
Denial (LSI)	-0.31**	0.10	0.74		
Verbal ability (IQ)	0.17**	0.05	1.19		
Thinking ability (IQ)	-0.04*	0.02	0.96		
Constant	4.59	4.26	98.60		

**p<0.01; **p<0.05

The first regression model with 11 variables is statistically significant (χ^2=182,43, df = 11, N = 230, p < .01) and explains 73% of the variance. In the first step, Verbal ability accounts for 25% (Cox & Snell) to 33% (Nagelkerke R square) of the variance, the second step adds Self-sacrifice style and accounts for 33% to 44% of the variance, the third step adds Reaction formation and accounts for 37% to 49% of the variance, the fourth step adds General mood and accounts for 42% to 55% of the variance, the fifth step adds Adaptive style and accounts for 45% to 60% of the variance, the sixth step adds Thinking ability and accounts for 47% to 63%, the seventh step adds Instinctive action and accounts for 49% to 65%, the eighth step adds Indirect action and accounts for 51% to 68%, the ninth step adds Denial, and accounts for 53% to 70%, the tenth step adds Stress-management scales, and accounts for 54% to 72%, and the eleventh step adds Intellectualization, and accounts for 55% to 73% of the variance. Thus, the employment status is positively associated with Adaptive style, Stress-management, Intellectualization, Indirect action and Verbal ability and negatively associated with Self-sacrifice style, General mood, Denial, Reaction formation, Instinctive action and Thinking ability.

Table 4. **Binary logistic regression analysis of the scales of Defense styles, Life styles, Coping scale, Emotional intelligence and Cognitive abilities by using the Forward: Conditional method (N = 230)**

Values	*B*	*S.E.*	*(Exp)B*	R^2 *(Coxe&Snell)*	R^2 *(Nagelkerke)*
Step 1				.50	.67
Image-distorting style (DSQ)	-0.23**	0.03	0.79		
Constant	4.45**	1.18	12691.05		
Step 2				.53	.71
Image-distorting style (DSQ)	-0.24**	0.03	0.78		
Adaptive style (DSQ)	0.07**	0.02	1.08		
Constant	5.33**	1.60	206.63		
Step 3				.55	.73
Image-distorting style (DSQ)	-0.23**	0.03	0.79		
Adaptive style (DSQ)	0.09**	0.02	1.09		
General mood (EQI)	-0.08**	0.03	0.92		
Constant	8.93**	2.15	7588.56		
Step 4				.56	.74
Image-distorting style (DSQ)	-0.21**	0.03	0.82		
Adaptive style (DSQ)	0.09**	0.03	1.10		
General mood (EQI)	-0.09**	0.03	0.91		
Regression (LSI)	-0.21*	0.10	0.81		
Constant	9.54**	2.19	13869.57		
Step 5				.57	.76
Image-distorting style (DSQ)	-0.20**	0.03	0.82		
Adaptive style (DSQ)	0.07**	0.03	1.08		
General mood (EQI)	-0.11**	0.03	0.90		
Regression (LSI)	-0.24*	0.10	0.78		
Indirect action (SASC)	0.20*	0.09	1.23		
Constant	9.13**	2.28	9205.98		
Step 6				.57	.76
Image-distorting style (DSQ)	-0.20**	0.03	0.82		
Adaptive style (DSQ)	0.08**	0.03	1.09		
General mood (EQI)	-0.09**	0.04	0.91		
Regression (LSI)	-0.22*	0.10	0.80		
Cautious action (SASC)	-0.14*	0.07	0.87		
Indirect action (SASC)	0.238**	0.09	1.25		
Constant	9.55**	2.33	14098.72		
Step 7				.58	.78
Image-distorting style (DSQ)	-0.21**	0.03	0.81		
Adaptive style (DSQ)	0.09**	0.03	1,.10		
General mood (EQI)	-0.08*	0.04	0.93		
Regression (LSI)	-0.28*	0.12	0.76		
Repression (LSI)	-0.31*	0.15	1.36		
Cautious action (SASC)	-0.18*	0.12	0.83		
Indirect action (SASC)	0.22*	0.08	1.24		
Constant	8.93**	2.35	7550.35		

Values	*B*	*S.E.*	*(Exp)B*	R^2 *(Cox&Snell)*	R^2 *(Nagelkerke)*
Step 8				.59	.79
Image-distorting style (DSQ)	-0.21**	0.04	0.81		
Adaptive style (DSQ)	0.09**	0.03	1.09		
General mood (EQI)	-0.06	0.04	0.95		
Regression (LSI)	-0.27*	0.11	0.76		
Repression (LSI)	-0.36*	0.15	1.43		
Cautious action (SASC)	-0.19*	0.08	0.83		
Instinctive action (SASC)	-0.16**	0.07	0.86		
Indirect action (SASC)	0.27**	0.10	1.31		
Constant	9.89**	4.47	19773.12		
Step 9				.59	.78
Image-distorting style (DSQ)	-0.23**	0.03	0.80		
Adaptive style (DSQ)	0.07**	0.03	1.10		
Regression (LSI)	-0.23*	0.11	0.80		
Repression (LSI)	0.40**	0.15	1.50		
Cautious action (SASC)	-0.21**	0.08	0.81		
Instinctive action (SASC)	-0.18**	0.07	0.81		
Indirect action (SASC)	0.21**	0.10	1.31		
Constant	8.23**	2.13	3731.71		

The second regression model with 9 variables is statistically significant $\chi^2 = 203.03$, $df = 7$, $N = 230$, $p < .01$ (excluded the Reaction formation scale) and explaining 78 % of the variance. The first step includes the Image-distorting style and accounts for 50 % (Cox & Snell) to 67% (Nagelkerke) of the variance, the second step adds Adaptive style and accounts for 53% to 71%, and the third step adds General mood and accounts for 55 % to 73% of variance for the dependent variable are explained. The fourth step adds Regression and accounts for 56% to 74%. The fifth and sixth steps add Cautious action un Indirect action and account for 57% to 76%. In the seventh step, Repression accounts for 58% to 78 % of the variance, the eight steps adds Instinctive action and account for 59% to 79%, but the last, ninth step which comprises all above variables except for the General mood, like the eighth step explain from 59% to 78 % of variance for the dependent variable.

Therefore employment status is positively associated with Adaptive style, Repression defenses style and Indirect action, and negatively associated with Regression, Caution action, Instinctive action strategy and Image-distorting style.

Discussion

Persons who are unemployed and employed were expected to differ on variables that are associated with employment status. However, neither thinking abilities, nor cognitive efficiency is associated with the employment status, but a positive association with the verbal abilities scale was obtained.

Although no other differences of cognitive abilities were discovered (of thinking, cognitive productivity), the results of the study correspond to similar findings obtained

in other studies – that intelligence is significant in labour relations (e.g., Gottfredson, 2002), that it has a positive connection with the employed status (Feist & Barron, 2003) and that individuals with higher intelligence more easily resolve complicated situations (Judge, Klinger, & Simon, 2010).

The results reveal that the indicators of emotional intelligence, too, are different in both groups. The employed persons are more aware of their emotions, they are more self-assured, have higher self-respect, are more independent, a quality necessary in order to fulfil work duties in a more responsible way. The results obtained in another study demonstrate a similar trend – the intrapersonal factor negatively correlates with the difficulty of decision-making in the choice of career (Di Fabio & Palazzeschi, 2009). But the results show also the fact that the unemployed persons are more empathic, form more successful interpersonal relationships and better adapt to everyday conditions. Consequently, it follows from these results that they probably do not feel badly about their unemployment situation.

For the unemployed the maladaptive, image-distorting, self-sacrificing defense styles and denial, regression, reaction formation, projection and displacement are more pronounced. Thus, an unemployed person with a higher interpersonal factor, on the one hand, is more empathic and forms good interpersonal relations, but on the other hand, using the above-mentioned defense mechanisms, avoids perceiving information that is emotionally unpleasant. Since the function of psychological defenses is to help avoid anxiety-causing situations, then it is not surprising that the unemployed attempt not to notice unpleasant occurrences, experiences or emotions related to life situations and mutual relationships. It must be noted that the obtained results on the one hand do not contradict the findings expressed in other research (for example, Bond 2004), but on the other hand one must be aware that interpretation of these results is limited, since the empirical research in this field is insufficient.

The results in relation to coping strategies have shown that in both groups differences are small. Nonetheless, the unemployed use the strategies of avoidance, cautious, persistent and instinctive action more frequently, but more rarely – indirect action. These results confirm the findings of other studies that describe a connection between problem solving abilities and unemployment status, (Christensen & Holsten, 2006) and those types of coping influence the activity of job-search (Caplan, Vinokur, Price, & Ryn, 1989).

One of the issues of the research was to clarify to what extent the variables used in the research predict employment status. To find out the answer to this question, several models of regression were checked, taking into account the obtained mutual correlations of all variables. The first regression model demonstrates that the unemployed persons resort to self-sacrificing defense style, denial, instinctive coping strategy, and display more positive general mood and higher thinking abilities (as visual reasoning), but use adaptive defense styles, stress management, intellectualization, indirect action and exhibit lower verbal abilities to a lesser degree. Although this model jointly comprises intelligence and the adaptive defense style, nonetheless, as Vaillant has pointed out in his research (Vaillant, 2000), the adaptive defense style is not connected with the individual's intelligence. Similar results were obtained also within the scope of this study, because

the analysis of correlations did not produce an interconnection between the cognitive abilities and adaptive defense style. Taking into account the indicators of the obtained model, which to a greater extent characterise the unemployed than the employed, the behaviour trend is outlined towards evasion of solving real problems, attempting not to "see" them, but, if the individual encounters them, then he/she experiences high stress and difficulties in solving the situation.

The second regression model demonstrates that a person, who to a greater extent uses the image-distorting style, regression, cautious action, but to a lesser degree the adaptive style, repression, indirect action and has a more positive general mood, will more likely fall into the unemployment status. Looking separately at each variable, one can say that they more or less are used by every individual, but in this case the results characterise persons who want to be left alone, will not able to assume responsibility, take decisive steps of action and to a lesser degree will use the adaptive defense together with repression and indirect action, because this behaviour is more characteristic for the employed persons.

Thus, the results show that the employed and unemployed persons have different personality characterisitics on several indicators. For example, intellectual resources – cognitive abilities and emotional intelligence – for the unemployed persons are closer linked to maladaptive defense mechanisms, where upon the cognitive abilities have a positive, but emotional intelligence has a negative sign as compared to the employed persons. Logistic regression models, too, have shown a clear – cut tendency that employment status is best of all predicted by defense styles and mechanisms, and coping strategies, which is a construct psychologically connected to defense mechanisms. Therefore, taking into account the outlined behavioural trends, one can further develop more precise adjustment programmes targeted to the specificity of the unemployed individual's personality. For example, the unemployed need assistance in mastering more efficient ways for coping with stress, to acquire practical skills in the job-search process, because, as Creed and colleagues have indicated (Creed, Machine, & Hicks, 1999) cognitively – behaviourally oriented courses have a positive and lasting effect on the unemployed. It means that people search for a job more actively and their self-efficiency increases. It is also necessary to stimulate people to more actively seek psychological consultations that presently are provided for the unemployed in Latvia (especially in small towns and rural areas, since there the greatest passivity of unemployed persons is observed) in order to facilitate the development of models of more adaptive behaviour and to reduce the use of maladaptive defense mechanisms and styles.

Limitations of the research

Regardless of the fact that the demographic indicators of the respondents were equated between the groups of employees and unemployed persons, however, the majority of the questionnaires of unemployed persons were collected in the rural area of Latvia, but the data of employed persons have been mainly collected in Riga, which could affect the results. Division by gender too limits interpretation of the results, for the results within the scope of this study to a greater extent are attributable to women, by more than 80%. Courses attended by the unemployed mainly consist of women.

Within the scope of this research only the cognitive and emotional intelligence, psychological defense mechanisms and coping strategies were analysed with the employed status, therefore the results, however valuable and meaningful, nonetheless are not the only factors related to the employed status. One can mention as an example the lower activity and interest in various social activities of the unemployed in comparison with employed persons, such as church-going, engagement in hobbies, cultural events, recreational locations (parks, beaches) etc. (Rimmerman & Araten-Bergman, 2009).

Also the main criterion of the selection of respondents was whether the person is working or is unemployed and has registered himself/herself regarding the unemployed status, comparing the groups by demographical indicators. Nevertheless, one must take into account in what manner the status can be influenced by the motivation to work, previous experience, whether the persons has ever worked at all, whether she/he has left work voluntarily or has been dismissed against his/her will, the material condition, whether the person has a spouse, whether the family gives him/her support or just the opposite, creates even greater stress are significant factors, which must be taken into consideration in researching the unemployment related issues in future. The results obtained in this study must also be examined very carefully, since they cannot prove causal relationships. For example, if the unemployed have maladaptive defense mechanisms, are these the consequences or the cause of unemployment?

Finally, it is important to note that although the results cannot be attributed to all employed and unemployed persons, but only to the group included in the study, they still provide interesting psychological profiles, which can be taken into account when developing support programmes for the unemployed.

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Psyhometric properties of the Russian version of the Self-Description Questionnaire II (SDQ-II)

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The purpose of this research was to introduce the Russian version of the Self-Description Questionnaire II (SDQ-II) and to determine its psychometric properties for use in Latvia with adolescents whose native language is Russian. The SDQ-II is an Australian self-concept instrument with 102 items. It was designed by Herbert Marsh. It is based on the Shavelson, Hubner, and Stanton (1976) hierarchical and multidimensional model and measures 11 different dimensions of self-concept. This study presents the various steps in the adaptation of this instrument. The sample consisted of 297 participants from Riga schools aged from 14 to 17 years (boys – 49.5%, girls – 50.5%). All the SDQ-II scales had high internal consistency and test-retest reliability. The factorial structure of the Russian version revealed ten factors instead of the eleven of the original version.

Key words: self-concept, reliability, factorial validity.

Introduction

Self-concept is recognized as one of the most important constructs in the social sciences. Positive self-concept is a positive outcome in itself and facilitates other desirable outcomes (Marsh, 2007). Therefore positive self-concept is an important goal in many fields – education, child development, health and others.

Adolescence is an important period for the development of the self-concept (Nurmi, 2004). During this period adolescents become more self-conscious, increasingly introspective and preoccupied with what others think of them (Harter, 2006). "The development of a positive self-image is recognized as a psychological task of adolescence around the world… Failure to achieve such a view of self has been linked to behavioral problems, such as drug and alcohol addiction, suicide, and juvenile crime" (Watkins, Juhasz, Walker, & Janvlaitiene, 1995, p.41). Self-concept is related to adolescent mental health (Marsh, Parada, & Ayotte, 2004). Self-concept is an important factor that contributes to educational outcomes (Marsh & Yeung, 1997).

Therefore research on developmental changes in self-concept during adolescence and of their consequences is an important task. In the light of this, reliable and valid instruments for self-concept assessment in adolescence are especially valuable. However, in Latvia there is a lack of such instruments. Thus, the purposes of this research are:

- to introduce the Russian version of the Self Description Questionnaire II (SDQ-II)[1], an Australian self-concept instrument which was designed by Marsh (1990) and which was adapted according to main principles of adaptation of tests (International Test Commission, 2010; Raščevska, 2005);
- to determine its psychometric properties for use in Latvia with adolescents whose native language is Russian.

Self-concept and the multidimensional approach to its measurement

Self-concept is a person's self-perceptions (Shavelson, Hubner, & Stanton, 1976). Many researchers (Hattie, 1992; Marsh, 1989, 2007; Marsh & Shavelson, 1985; Shavelson, Hubner, & Stanton, 1976) emphasize that self-concept is a multidimensional construct with highly differentiated components in addition to a global self-concept component. Thus, in recent years strong emphasis has been placed on the multidimensionality of self-concept.

The multidimensional approach to the measurement of self-concept instead of global measurement has been advocated by Marsh (1990 a, b, c, 2007), who with his co-authors has demonstrated that self-concept cannot be adequately understood without taking into account its multidimensionality (Marsh, Ellis, & Craven, 2002; Marsh, Parada, & Ayotte, 2004; Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2006). Marsh has developed the Self-Decription Questionnaire (SDQ), which is designed to measure self-concept in elementary-aged children (pre-adolescents) in grades 4 through 6 (SDQ-I), in early to middle adolescents in grades 7 through 10 (SDQ-II), and in late adolescents and early adults (SDQ-III). The Shavelson, Hubner, and Stanton (1976) model of self-concept served as the basis for these instruments. Shavelson et al. (1976) reviewed theoretical and empirical research and posited a self-concept construct with seven features: self-concept is organized (structured), multidimensional (multifaceted), hierarchical, stable, developmental, has both a descriptive and an evaluative aspect, and is differentiable from other constructs. Shavelson et al. proposed a general self-concept at the apex of the hierarchy that was divided into academic and nonacademic self-concepts. Academic self-concept was further divided into self-concepts in particular subject areas; nonacademic self-concept was divided into three areas: social, emotional and physical self-concepts.

Using this hierarchical multidimensional model as a starting point, Marsh has developed the set of the SDQ instruments. The results with respect to the hierarchical ordering were inconclusive and later Marsh developed a different hierarchical self-concept model (the Marsh-Shavelson model), in which "Verbal" and "Math" self-concepts were distinct (Marsh & Shavelson, 1985). In turn, the results of research with the SDQ provided strong support for the multidimensionality of self-concept.

SDQ: General description and adaptation in other cultural contexts

The SDQ is a series of three instruments designed to measure self-concept for children and preadolescents (SDQ-I), young and middle adolescents (SDQ-II) and late adolescents and young adults (SDQ-III). The scales of the three SDQs reflect a person's self-ratings in various areas of self-concept (see Table 1).

[1] The Russian version of the scale is available from the author of the paper upon request.

Table 1. **The scales of the SDQ instruments**

SDQ-I	*SDQ-II*	*SDQ-III*
Physical Abilities	Physical Abilities	Physical Abilities
Physical Appearance	Physical Appearance	Physical Appearance
Peer Relations	Opposite-Sex Relations	Opposite-Sex Relations
Parent Relations	Same-Sex Relations	Same-Sex Relations
Reading	Parent Relations	Parent Relations
Mathematics	Honesty-Trustworthiness	Honesty-Trustworthiness
General School	Emotional Stability	Emotional Stability
General Self	Mathematics	Problem Solving
	Verbal	Religion-Spirituality
	General School	Mathematics
	General Self	Verbal
		General Academic
		General Self

The three SDQ are now acknowledged as the most reliable and valid measures of self-concept currently available (Boyle, 1994; Byrne, 1996; Hattie, 1992; Wylie, 1989). These instruments have been translated and adapted in many countries. For example, there are not only the original Australian English versions of the SDQ-I (Marsh. 1990a), the SDQ-II (Marsh, 1990b) and the SDQ-III (Marsh, 1990c), but also Arabic versions of the SDQ-I which were adapted in the United Arab Emirates (Abu-Hilal & Bahri, 2000) and in Lebanon (Nakadi, 1995; Sardouk, 1995; Shihab, 1996 as cited in El-Hassan, 2004), the Lithuanian version of the SDQ-I (Watkins, Juhasz, Walker, & Janvlaitiene, 1995), the Norwegian version of the SDQ-II (Skaalvik, 1996), the Chinese version of the SDQ-II (Yeung & Lee, 1998), the French version of the SDQ-II (Guérin, Marsh, & Famose, 2003), the French-Canadian version of the SDQ-II (Marsh, Parada, & Ayotte, 2004), the Portuguese version of the SDQ-III (Faria, 1996), as well as others.

It is important to emphasize that studies with the adapted versions of the SDQ revealed that the subscales of the three SDQ are reliable, while CFA in general identified with some exceptions the facets that the three SDQ were designed to measure. For example, El-Hassan (2004) identified seven factors as in the original version of the SDQ-I. However she reports that the eighth factor representing a general component loaded heavily on Physical Appearance, Peer Relations, and General School. Watkins, Juhasz, Walker and Janvlaitiene (1995) also concluded that factor analysis of the responses to the SDQ-I generally supported the factors the SDQ was designed to measure. The exception were the School scale variables, which tend to load on the Maths factor, and the General Self scale, which tends to load on the Peer scale.

The Portuguese version of the SDQ-III (Faria, 1996) revealed twelve factors instead of the thirteen of the original scale. The "global" self-concept items were mixed with several other variables from different domains, such as Physical Appearance, Opposite-Sex Peer Relationships, Emotional Stability, Same-Sex Peer Relationships, Parent Relationships, General School. In the French version (Guérin, Marsh, & Famose, 2003) the 11 components the SDQ-II instrument was designed to measure, were clearly identified. The results of the investigation (Marsh, Parada, & Ayotte, 2004) also provided strong

support for the French-Canadian translation of the SDQ-II: CFAs demonstrated that the SDQ-II factors were reliable, well defined and highly differentiated.

In general, the reviews of the studies of the factor structure and psychometric properties of the SDQ in different samples and cultural contexts allows us to conclude that the reliability estimates were satisfactory and the factor analytic evidence generally supported the existence of the expected self-concepts facets. The purpose of this research is to determine the psychometric properties of the Russian version of the Self-Description Questionnaire II in a sample of Latvian adolescents whose native language is Russian.

Method

Participants

The sample consisted of 297 participants aged between 14 and 17 years (M = 15.11, SD = .46); 49.5 % of participants were boys (n = 147) and 50.5% were girls (n = 150). All participants attended Riga schools. All participants were studying in the 9th grade in Russian language schools. Data were collected during the period 16th December 2010 to 27th January 2011.

Twenty eight participants aged between 14 and 16 years (M = 15.00, SD = .38) also took part in follow-up retesting for short-term stability estimation (over a 4-week interval). Of these, 46.4% were boys (n = 13) and 53.6% were girls (n = 15).

Instrument

Two independent translators translated the SDQ-II from English into Russian. The two Russian versions of the SDQ-II items were compared and the best items chosen (in discussion between one translator and an independent expert). "Better" translations were determined to be better for the following reasons:

- appropriateness of the terminology;
- linguistic correctness;
- equivalence between the English and the final Russian versions.

The resulting Russian version of the SDQ-II was tested on 20 pupils in order to check their understanding of the items. The instrument was clearly understandable to the respondents and interesting for them. The Russian version of the SDQ-II includes the same number of items in the same sequence as the English SDQ-II.

The Self-Description Questionnaire-II is an instrument, which assesses three areas of academic self-concept and seven areas of nonacademic self-concept, as well as general self-concept. The SDQ-II thus consists of eleven subscales. The SDQ-II consists of 102 items. Responses are made on a 6-point Likert scale (1 – False; 2 – Mostly false; 3 – More False than True; 4 – More True Than False; 5 – Mostly True; 6 – True). Each of the 11 SDQ-II scale scores is based on the respondent's self-ratings on 8-10 items. Half of items are negatively worded. If the item is negatively worded, it is necessary to reverse the value of the student's response by subtracting it from 7. The higher score the more positive the self-concept.

In the Russian version as well as in the original version for the Opposite-Sex Relations scale items 22, 44, 55 and 77 ("I make friends easily with girls", "I am popular with girls", "I do not get along very well with girls" and "Most girls try to avoid me") are scored only for males and items 21, 43, 54 and 76 ("I make friends easily with boys", "I am popular with boys", "I do not get along very well with boys" and "Most boys try to avoid me") – only for females. In turn for the Same-Sex Relations scale items 21, 43, 54 and 76 are scored only for males and 2, 44, 55 and 77 are scored for females.

A brief description of the eleven SDQ-II scales is as follows:

1. Physical Abilities – student ratings of their skills and interest in sports and physical activities;
2. Physical Appearance – student ratings of their physical attractiveness;
3. Opposite-Sex Relations – student ratings of their interactions with peers of the opposite sex, of their popularity with members of the opposite sex and how easily they make friends with members of the opposite sex;
4. Same-Sex Relations – student ratings of their interactions with peers of the same sex, of their popularity with members of the same sex and how easily they make friends with members of the same sex;
5. Parent Relations – student ratings of their interactions with parents, of how well they get along with their parents, whether they like their parents;
6. Honesty-Trustworthiness – student ratings of their honesty and trustworthiness;
7. Emotional Stability – student ratings of themselves as being calm and relaxed, of emotional stability, and of how much they worry;
8. Mathematics – student ratings of their ability in and their enjoyment/ interest in mathematics;
9. Verbal – student ratings of their skills and ability in language and reading;
10. General School – student ratings of their ability and their enjoyment/ interest in "all school subjects";
11. General Self – student ratings of themselves as effective, capable individuals.

Procedure

Data were collected in class groups without any time limit. The questionnaire administration took place during regular school hours. The researcher read aloud the instructions on the front of the instrument before each adolescent completed it. Most adolescents completed the questionnaire in less than 20 minutes.

Results

Descriptive statistics and reliability

Cronbach's alpha coefficients for all original scales of the SDQ-II were computed. The coefficients ranged from .70 to .90. Test-retest reliability for all scales was above .52, so that it could be said that reliability for all scales was acceptably high (see Table 2) .52 (see Table 2).

Table 2. **Descriptive statistics and reliability indices for the Russian Version of the SDQ-II**

Scale of SDQ II	*Number of items*	*Cronbach's alpha*	*Test-retest reliability*	*Mean*	*SD*
Physical Abilities	8	.89	.76**	36.13	9.46
Physical Appearance	8	.90	.72**	34.72	8.55
Opposite-Sex Relations	8	.85	.86**	34.81	7.81
Same-Sex Relations	10	.85	.83**	46.67	8.76
Parent Relations	8	.85	.71**	38.90	7.48
Honesty-Trustworthiness	10	.70	.80**	39.14	7.07
Emotional Stability	10	.82	.94**	37.76	9.63
Mathematics	10	.90	.83**	37.10	11.76
Verbal	10	.81	.52**	40.42	9.04
General School	10	.87	.88**	45.97	8.51
General Self	10	.80	.88**	47.51	7.50

**$p<.01$

With ten exceptions, most items of the SDQ-II showed good reaction indices (see Table 3). The average reaction index was 4.32. In the original version, eleven items had a reaction index above 5.00 and were retained in the scale (Marsh, 1990b). In the Russian version ten items (items 8, 10, 20, 31, 65, 74, 76/77, 85, 90, 97) also had a reaction index higher than 5.00. As well as in the original version, in the Russian version the items with higher reaction indices were retained.

With two exceptions, coefficients of correlations between each item and the sum of the remaining items in the scale ranged from .24 to .80, and in most cases were moderately high or high. However, in two cases (items 7 and 98) corrected item-total correlations were low (less than .20) and these items should be modified or deleted from the scale.

However in the further factor analysis these two items were retained for two reasons. Deletion of these items from the scales (item 7 – Emotional Stability and item 89 – Honesty-Trustworthiness) does not increase the reliability of these scales: if these items are deleted Cronbach's alpha coefficients are .83 for the Emotional Stability scale and .71 for the Honesty-Trustworthiness scale. The second reason – the factor analysis was performed on responses to the 51 item pairs.

Factorial validity

Consistent with most SDQ-II research (Marsh, 1990b), the 8 or 10 items from the 11 SDQ-II scales were divided into 4 or 5 item pairs such that the first two items were assigned to the first pair, the next two items to the next pair, and so on. Marsh (1990b) argues that using item pairs is preferable for the following reasons:

- the ratio of subjects to variables is doubled;
- the new variables are more reliable and have smaller proportions of unique variance;
- factor loadings are less affected by the idiosyncrasies of individual items.

A factor analysis, using the Kaiser normalization and an oblique rotation to a final solution with delta set to 0 was performed on responses to the 51 item pairs. The KMO measure was .88, and the Bartlett test was significant χ^2 (1275) = 9223.458 (p = .000).

Table 3. **Item statistics by scale for the Russian version of the SDQ-II**

Item	*M*	*SD*	*Corrected Item-Total Correlation*	*Item*	*M*	*SD*	*Corrected Item-Total Correlation*	*Item*	*M*	*SD*	*Corrected Item-Total Correlation*
Physical Abilities				***Parent Relations***				***Verbal***			
5	4.58	1.51	.70	8	5.07	1.22	.52	6	4.51	1.52	.48
16	4.52	1.66	.58	19	4.89	1.24	.74	17	2.82	1.49	.49
27	4.57	1.53	.80	30	4.82	1.44	.63	28	4.64	1.37	.35
38	4.88	1.44	.63	41	4.70	1.42	.53	39	3.93	1.46	.68
49	4.04	1.60	.74	52	4.02	1.57	.56	50	4.72	1.44	.36
60	4.78	1.68	.63	63	4.63	1.48	.71	61	3.04	1.66	.59
71	3.77	1.74	.48	74	5.35	1.36	.43	72	4.60	1.49	.36
82	4.99	1.50	.73	85	5.41	1.00	.58	83	4.09	1.41	.66
								92	4.13	1.56	.25
								99	3.93	1.48	.70
Scale mean	4.52	1.58	.66	*Scale mean*	4.86	1.34	.59	*Scale mean*	4.04	1.49	.49
Physical Appearance				***Honesty – Trustworthiness***				***General School***			
2	4.47	1.44	.59	4	4.71	1.43	.24	9	3.36	1.42	.52
13	4.21	1.34	.69	15	4.47	1.13	.39	20	5.05	1.18	.59
24	3.82	1.34	.67	26	2.91	1.42	.39	31	5.31	1.04	.26
35	4.32	1.36	.80	37	3.49	1.41	.53	42	4.77	1.29	.59
46	4.79	1.54	.68	48	2.74	1.55	.32	53	4.31	1.20	.68
57	4.28	1.22	.69	59	4.48	1.31	.43	64	5.14	1.19	.65
68	4.71	1.54	.70	70	2.82	1.42	.40	75	4.22	1.29	.69
79	4.11	1.45	.61	81	4.55	1.30	.29	86	4.59	1.32	.64
				91	4.36	1.32	.49	94	4.53	1.27	.69
				98	4.62	1.24	.14	101	4.67	1.20	.60
Scale mean	4.34	1.40	.69	*Scale mean*	3.92	1.35	.36	*Scale mean*	4.60	1.24	.59
Opposite-Sex Relations*				***Emotional Stability***				***General Self***			
11	3.30	1.42	.53	7	3.61	1.39	.19	3	4.76	1.17	.54
21/22	4.46	1.38	.61	18	3.57	1.68	.61	14	4.56	1.42	.39
33	3.84	1.49	.63	29	3.36	1.62	.56	25	4.59	.945	.49
43/44	3.77	1.40	.62	40	4.63	1.36	.43	36	4.58	1.31	.46
54/55	4.62	1.38	.43	51	3.84	1.48	.45	47	4.66	1.06	.62
66	4.59	1.54	.63	62	3.75	1.73	.62	58	4.35	1.51	.50
76/77	5.08	1.13	.50	73	3.99	1.44	.44	69	4.88	1.09	.43
88	4.14	1.46	.73	84	3.76	1.76	.68	80	4.61	1.48	.52
				93	3.98	1.57	.38	90	5.31	1.01	.35
				100	3.27	1.57	.59	97	5.22	1.31	.56
Scale mean	4.35	1.40	.56	*Scale mean*	3.78	1.56	.50	*Scale mean*	4.75	1.23	.49
Same-Sex Relations*				***Math***							
10	5.03	1.34	.57	1	3.52	1.63	.76				
21/22	4.57	1.33	.67	12	3.74	1.62	.66				
32	4.18	1.40	.37	23	3.08	1.61	.69				
43/44	3.83	1.35	.58	34	3.97	1.68	.63				
54/55	4.44	1.49	.54	45	3.34	1.69	.77				
65	5.38	1.08	.50	56	4.04	1.50	.62				
76/77	4.94	1.30	.55	67	3.92	1.51	.74				
87	4.62	1.37	.66	78	3.63	1.79	.27				
95	4.85	1.39	.61	89	3.52	1.60	.68				
102	4.83	1.30	.51	96	4.34	1.66	.68				
Scale mean	4.67	1.34	.56	*Scale mean*	3.71	1.63	.65				

*Four of the items depend on whether the respondent is a boy or a girl

Table 4. **Results of Principal Factor Analysis with an Oblique Rotation for the Russian Version of the SDQ-II**

	Factor Loadings									
Variable	*F1*	*F2*	*F3*	*F4*	*F5*	*F6*	*F7*	*F8*	*F9*	*F10*
Physical Appearance 2	**.77**	-.01	-.08	-.08	-.05	-.01	.07	-.00	.13	.01
Physical Appearance 3	**.72**	-.05	.02	-.02	-.05	.05	.12	-.07	.11	.05
Physical Appearance 4	**.70**	.01	.00	-.01	-.05	.04	.10	-.01	.15	.03
Physical Appearance 1	**.66**	.02	-.09	.01	.01	.05	-.05	-.00	.18	-.06
General Self 1	**.48**	-.06	.18	.18	-.00	.08	-.04	-.17	-.03	.28
Math 1	-.07	**.87**	-.00	-.04	-.01	-.09	.09	-.01	.04	.02
Math 5	-.03	**.87**	-.02	.01	.00	-.01	-.03	.02	.11	.03
Math 2	.04	**.85**	.06	.03	-.03	.01	.02	-.05	-.05	-.03
Math 3	-.05	**.84**	.16	.12	-.02	-.00	-.03	-.06	.01	.11
Math 4	.04	**.61**	-.01	-.01	-.03	.10	-.03	-.02	-.10	.12
Verbal 3	-.07	-.04	**-.73**	.01	-.01	-.01	.03	-.07	-.08	.03
Verbal 2	-.08	-.07	**-.71**	.05	.01	-.00	.05	-.04	.07	.10
Verbal 4	-.01	.00	**-.69**	.01	.12	.05	-.09	-.06	.03	.04
Verbal 1	.12	.02	**-.68**	.04	-.06	.01	-.02	.12	-.09	-.02
Verbal 5	.06	-.05	**-.63**	.03	-.03	-.00	-.03	-.05	.11	.10
Honesty-Trustworthiness 2	-.03	.07	.08	**.70**	-.05	-.14	.05	.03	.04	.05
Honesty-Trustworthiness 4	-.06	.06	-.12	**.69**	-.01	-.07	.08	-.03	.00	-.14
Honesty-Trustworthiness 3	-.03	.06	-.08	**.64**	.01	.09	-.09	.00	-.09	-.04
Honesty-Trustworthiness 5	-.02	-.12	-.03	**.50**	-.02	.04	-.02	-.09	.14	.16
Honesty-Trustworthiness 1	.09	-.02	-.01	**.43**	.03	.10	.03	-.05	-.04	-.03
Physical Abilities 3	-.01	.01	-.01	.04	**-.86**	-.01	.03	.02	.01	.01
Physical Abilities 1	-.05	.03	.00	.01	**-.85**	.04	-.08	.02	-.00	-.05
Physical Abilities 2	.11	-.01	.05	.00	**-.85**	.02	-.02	.02	.01	-.03
Physical Abilities 4	-.11	.01	-.00	-.04	**-.81**	.01	.05	-.03	-.00	.01
Same-Sex Relations 5	-.09	-.07	.02	-.05	-.06	**.81**	.04	-.03	-.06	.01
Same-Sex Relations 4	.03	.01	-.04	.02	-.03	**.73**	.01	-.04	.08	.03
Same-Sex Relations 1	.11	.09	-.07	-.02	-.05	**.72**	.05	-.03	.02	-.21
Same-Sex Relations 3	-.10	-.02	.05	.08	-.00	**.64**	.04	-.04	.17	.16
Same-Sex Relations 2	.28	.12	-.03	-.01	-.02	**.44**	-.03	.04	.22	.00
Emotional Stability 3	.03	-.02	-.06	-.00	-.04	-.02	**.78**	-.08	-.08	-.02
Emotional Stability 5	.03	.04	-.02	.16	.02	.10	**.74**	.10	-.09	-.02
Emotional Stability 4	.04	.07	-.05	-.01	-.00	-.04	**.70**	-.09	.17	-.03
Emotional Stability 2	.16	.02	.02	-.06	-.08	.04	**.58**	-.22	-.07	-.01
Emotional Stability 1	-.12	-.06	.17	-.06	.00	.04	**.58**	.05	.13	.09
Parent Relations 3	.03	.04	-.04	.12	-.02	-.03	.04	**-.83**	-.00	-.14
Parent Relations 2	-.03	.08	-.04	-.06	.00	-.01	.05	**-.77**	.07	-.06
Parent Relations 1	.08	.02	.08	.01	.01	.13	.02	**-.71**	-.03	.11
Parent Relations 4	-.07	-.03	-.03	.03	-.02	.03	-.03	**-.60**	-.01	.04
Opposite-Sex Relations 3	-.04	.01	.00	.02	-.03	.11	.03	-.05	**.76**	.01
Opposite-Sex Relations 1	.11	-.04	.05	.03	-.05	.07	.02	-.04	**.65**	.02
Opposite-Sex Relations 4	.25	.07	-.09	-.05	-.03	.11	-.02	-.04	**.64**	-.11
Opposite-Sex Relations 2	.33	.00	-.02	-.04	-.13	.02	.08	.07	**.56**	-.03
General School 3	.00	.18	-.13	-.03	.01	.06	.00	-.00	.00	**.68**
General School 4	-.12	.24	-.16	-.03	-.08	.01	.07	-.03	.00	**.67**
General School 5	.03	.14	-.26	-.05	-.01	-.01	.08	.03	.05	**.64**
General School 2	.02	.10	-.05	.02	.02	-.00	-.04	-.07	-.05	**.56**
General Self 3	.29	-.06	-.06	.14	-.07	-.04	.04	-.08	.10	**.47**
General School 1	.16	.26	-.13	.08	.04	.16	-.07	.07	-.08	**.46**
General Self 5	.27	-.11	-.13	-.01	-.20	.03	.07	-.16	-.02	**.36**
General Self 4	.28	.01	.01	-.01	-.17	-.02	.07	-.22	-.05	**.36**
General Self 2	.28	.05	-.07	.13	-.13	-.02	.02	-.11	.04	**.29**
Eigenvalues	6.57	4.66	4.01	3.04	5.22	4.86	3.83	5.27	4.72	5.86

The factor analysis of the item pairs in previous studies generally supported the factors the SDQ-II was designed to measure. However the factor analysis in this study reveals a structure of ten factors, instead of eleven in the original version of SDQ-II. The factor pattern matrix for the ten-factor solution is shown in Table 4.

Eight factors had high loadings for items from equivalent SDQ-II dimensions and could be identified as self-concept about: Math (F2), Verbal (F3), Honesty-Trustworthiness (F4), Physical Abilities (F4), Same-Sex Peer Relations (F6), Emotional Stability (F7), Parent Relations (F8) and Opposite-Sex Peer Relations (F9). Two of the factors had high loadings for items from different dimensions of self-concept in the original version: Factor 1 (F1) with variables from Physical Appearance (the majority) and General Self; Factor 10 (F10) with all variables from General School and General Self.

The correlations among the factors ranged from -.33 to .42 (median = .03; see Table 5). The largest correlations were between the factor "Physical Appearance/ General Self" and the factor "Opposite-Sex Relations" (.42), the factor "Opposite-Sex Relations" and the factor "Same-Sex Relations"(.35), the factor "General School/ General Self" and the factor "Math" (.34), the factor "General School/ General Self" and the factor "Verbal" (-.33).

Table 5. **Correlations among the factors for the Russian version of the SDQ-II**

	F1	*F2*	*F3*	*F4*	*F5*	*F6*	*F7*	*F8*	*F9*
Physical Appearance/General Self (F1)	-								
Math (F2)	.03	-							
Verbal (F3)	-.16	-.07	-						
Honesty-Trustworthiness (F4)	.11	.13	-.22	-					
Physical Abilities (F5)	-.29	-.14	.03	-.08	-				
Same-Sex Relations (F6)	.29	.10	-.11	.09	-.25	-			
Emotional Stability (F7)	.15	.05	.09	.06	-.28	.15	-		
Parent Relations (F8)	-.28	-.08	.15	-.31	.28	-.27	-.29	-	
Opposite-Sex Relations (F9)	.42	-.03	-.03	-.02	-.24	.35	.21	-.14	-
General School/General Self (F10)	.29	.34	-.33	.17	-.18	.15	.08	-.30	.06

There were also substantial correlations between "Physical Appearance/ General Self" and "Physical Abilities" (-.29), "Physical Appearance/ General Self" and "Same-Sex Relations" (.29), "Physical Appearance/ General Self" and "Parent relations" (-.28), "Physical Appearance/ General Self" and "General School/ General Self" (.29), "Verbal" and "Honesty-Trustworthiness" (-.22), "Parent Relations" and "Honesty-Trustworthiness" (-.31), "Physical Abilities" and "Same-Sex Relations" (-.25), "Physical Abilities" and "Emotional Stability" (-.28), "Physical Abilities" and "Parent Relations" (.28), "Physical Abilities" and "Opposite-Sex Relations" (-.24); "Parent Relations" and "Same-Sex Relations" (-.27), "Emotional Stability" and "Parent Relations" (-.29), "Emotional Stability" and "Opposite-Sex Relations" (.21), "Parent Relations" and "General School/ General Self" (-.30).

There were substantial correlations between the factor "General School/ General Self" and other academic self-concepts and between different nonacademic factors. The correlation between Math and Verbal self-concepts (-.07) is close to zero, what is consistent with other SDQ research and the Marsh-Shavelson (Marsh & Shavelson, 1985) revised model of self-concept.

Discussion

This study investigated the reliability and the factorial structure of the Russian version of SDQ-II. The SDQ-II responses are internally consistent and stable over time. However some items require further modification.

In general in previous studies factor analysis of responses to the SDQ-II by diverse populations of subjects of different ages have identified the 11 hypothesized factors. In this study the results of the factor analysis of the SDQ-II item pairs also identified with some exceptions the facets that the SDQ-II was designed to measure. However the factorial structure of the Russian version of the SDQ-II differs somewhat from the factorial structure of the original English version. The factor analysis yielded ten dimensions characterizing different aspects of self-concept. Eight dimensions were identical to the dimensions from the original English version of the SDQ-II: Math, Verbal, Honesty-Trustworthiness, Physical Abilities, Same-Sex Peer Relations, Emotional Stability, Parent Relations and Opposite-Sex Peer Relations. Two of the factors were loaded on by items from different dimensions of self-concept from in the original version. The factors with "crossover" variables involved:

- the presence of "General Self" items together with "Physical Appearance" items (F1);
- the presence of "General Self" items together with "General School" items (F10).

The "global" self-concept items are mixed with several other variables from different domains, which is consistent with some other SDQ research (El-Hassan, 2004; Faria, 1996; Watkins, Juhasz, Walker, & Janvlaitiene, 1995). As Faria notes (1996), this is evidence that global self-concept is related to several domains of self-concept because it represents the general self-worth, the general self-acceptance and the general self-appraisal aspects of the self. "The global self-concept is the personal synthesis of self-concept and is probably related to the most valued dimensions of self" (Faria, 1996, p.348).

An examination of the correlations among the factors resulting from the oblique rotation for the ten-factor solution indicates that the largest correlations occur:

- between the factor "Physical Appearance/General Self" and the factor "Opposite-Sex Relations", showing that relations with peers of the opposite sex are related to perception of own appearance during adolescence;
- between the factor "Opposite-Sex Relations" and the factor "Same-Sex Relations", showing that during adolescence popularity among members of the opposite sex is related to popularity among members of the same sex;
- between the factor "General School/ General Self" and "Math" and "Verbal".

A very interesting finding is that the correlation between "General School/General Self" and "Math" is positive and between "General School/General Self" and "Verbal" is negative. These correlations show that students' positive ratings of their ability in and their enjoyment/interest in mathematics are related to their general positive self-perception in all school subjects; however their high ratings of their skills and ability in the Russian language and reading are related with general unsatisfactory self-perception in all school subjects. This fact may reflect the unimportance of Russian language and reading as a vehicle of transmitting knowledge in the school context and the importance of Mathematics in academic success.

In this study the psychometric properties of the Russian version of the SDQ-II confirm that it is a reliable instrument for use in Latvia. As mentioned above, studies with the adapted versions of the SDQ-II revealed that the subscales of the SDQ-II are reliable, while CFA in general identified with some exceptions the facets that the SDQ-II was designed to measure. According to that, in future studies in Latvia it would be acceptable to use original factorial structure of the SDQ-II with excluded "General Self" items because of the possibility to compare results of empirical research of self-concept in Latvia with results of empirical studies of self-concept in the world. Secondly, the new version of factorial structure of the Russian version of the SDQ-II should be verified in more nationally representative sample.

Further work with the Russian version of the SDQ-II is possible in several areas. It would be helpful to carry out confirmatory factor analysis based on data from a larger and more representative sample than in this study. Additionally, in this research the item analysis and factor analysis did not take age and gender into account. One of the main tasks is to develop a Latvian adaptation of the SDQ-II.

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