SOME PERSONALITY-RELATED CONSTRUCTS PREDICTING SUCCESS IN ESTONIAN MILITARY CONSCRIPTION TRAINING

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Abstract. This article contributes to the research of personality and military morale, analysing the links between several psychological variables and performance. The effectiveness of the military unit is usually measured by indicators reflecting performance, however in military conscription service successful completion of the training could be considered as performance. In order to better understand which variables are specific to higher- and lower-performing groups of soldiers, several psychological and socio-demographic variables such as personality, military morale, affectivity, regulatory focus, self-esteem, self-efficacy, person-organisation fit and age, education, mother tongue, place of residence and student status were included in the study. Performance, as a dependent variable, was measured through the theoretical, practical and physical elements of the soldiers' basic training final exam. A sample of 241 conscripts from the Estonian Defence Forces (EDF) participated in the research and the Kruskal-Wallis test with combination of ordinal logistic regression was used to analyse the data. The results indicated that openness to experience, person-organisation fit, level of education and status as a student were the most influential variables related to the performance indicators.

Keywords: training performance, military, personality related variables

1. Introduction

In the military environment, the requirements for personnel are demanding (O'Sullivan, 2016: 165)[1]. This applies to both the training period and subsequent service either in reserve or in active form (Bray et al., 2001). EDF is based on the concept of reserve units, meaning that active service for conscripts generally consists of a series of training events, starting from the soldier's basic skills, followed by specialist, squad, platoon, company and battalion-level courses and exercises. From this perspective, conscription service could be viewed as a learning-teaching environment, although under

[1] At the request of the author an in-text referencing style (APA) is used.

demanding and stressful conditions (Bartone et al., 2013), which requires soldiers who are emotionally stable, conscious, physically fit, etc. (Gifford, 2006; Kyröläinen et al., 2018; Bray et al., 2001). In general, both success in military training and in the subsequent service in reserve as a part of the combat readiness could be influenced by several factors (Kyröläinen et al., 2018), for instance psycho-social, physical and motivational.

In the literature, discussion about the various psychological constructs which might predict performance have mostly concentrated on cognitive ability (CA) and personality traits (Schmitt, 2014). For instance, Mackey & DeOrteniis (2018) concluded in their meta-analyses that CA predicts work and training performance. However, due to the availability of the data, this study omits this aspect and concentrates on personality-related constructs instead. Among others, one of the most researched predictors of performance has been Big Five personality traits (van der Linden et al., 2017), demonstrating low or moderate, but consistent, relations between Big Five traits and job performance (Barrick, Mount & Judge, 2001; Judge et al., 2013). More precisely, He et al. (2019) demonstrated in their second order meta-analysis that the most important predictor for job performance is conscientiousness, however the corrected correlation remained modest in value.

Despite rather consistent results about personality and performance relations, some authors (for instance Rothstein & Goffin, 2006; Day & Schleicher, 2006) argue that, in addition to the broad personality traits (Big Five) which are suitable rather for a wider performance prediction, narrow traits are also needed, especially for specific job performance which is closer to the real tasks employees have to accomplish in their working life. Taking this need, we included some psychological variables in the study (explained in more detail in the following sections), all of which were argued to predict work-related outcomes. Thus, we included military morale as work engagement and burnout (van Boxmeer et al., 2007) into the performance predictors, arguing that it could be developed (in addition to other things) by meaningful, well-organised and supportive training. Following the same logic, we also added affectivity (Watson & Clark, 1992), general self-esteem (Rosenberg et al., 1995), person-organisation fit (Kristof, 1996), regulatory focus (Higgins, 1997) and leadership self-efficacy (Paglis, 2010), hoping that at least some of them will demonstrate incremental validity over the personality traits predicting training performance among EDF conscripts and at the same time being conceptually different from personality and cognitive ability (Sørlie et.al, 2020). Moreover, drawing support from Fosse et al. (2015), Salo (2008) and Kasemaa & Säälik (2021) who demonstrated the links between

socio-demographic variables and performance or performance-related variables in the military, we also used education, place of residence, mother tongue, age and student status as performance predictors.

The aim of this research is therefore to find the set of psychological and socio-demographic variables which are related to the performance measured by the final exams of the soldiers' basic training. The results might contribute to a better understanding of the training performance contributors, especially from the perspective of individual differences. Therefore, we are interested in the following questions: 1) How do psychological variables such as personality, military morale, affectivity, regulatory focus, self-esteem, self-efficacy and person-organisation fit relate to training performance?; 2) How do socio-demographic variables such as age, education, mother tongue, place of residence and student status relate to training performance?

2. Individual Differences Predicting Training Performance in the Military

Personality

We used Big Five theory (McCrae & Costa, 1987; McCrae & Costa, 2008) to conceptualise personality traits such as Openness to Experience (O), Conscientiousness (C), Extraversion (E), Agreeableness (A) and Neuroticism (N). Individuals high in openness to experience tend to be open to fantasy, aesthetics, feelings, actions, ideas and values, and they are not conventional and traditional in their outlook and behaviour. Individuals high in conscientiousness are competent, orderly, dutiful, achievement-orientated, self-disciplined and deliberate, behave rather in a planned way, and are hard-working and reliable. Individuals high in extraversion enjoy people around them and they tend to work well in groups and teams. Individuals high in agreeableness tend to be empathetic and altruistic; this trait also reflects cooperation and social harmony. Neurotic people are moody in general; they tend to respond badly to stressors and interpret situations as threatening.

Most scholars in this area acknowledge that personality has predictive validity for performance. For instance, in their meta-analyses Barrick, Mount, & Judge (2001) found a positive relation between O, E and training performance; at the same time, a negative relation was found between N and performance by Barrick & Mount (1991). Salgado (1997) found N, O, A and C as predictors of training criteria. Additionally, McDonald, Norton & Hodgdon (1990) found that those individuals who are successful in training programs

for high-risk occupations (such as the armed forces) are more extraverted and conscious and less neurotic and agreeable.

Moving into the military, personality traits predict among others the ability to lead, satisfaction, mental health and dropout during military service (Fiedler, Oltmanns, & Turkheimer, 2004; McCormack & Mellor, 2002). However, in his meta-analyses Salgado (1998) found that only emotional stability predicted performance through all military samples. At the same time, Bilgiç and Sümer (2009) found facets of C, A and N predicting aspects of conscript performance in Turkey and (Fosse et al. (2015) found C predicting academic and military performance among Norwegian cadets. Additionally, E and N were found as significant predictors of pass/fail in military training in Norway (Hartmann et al., 2003; Hartmann & Grønnerød, 2009) and N as a predictor of conscripts' attrition from military training in Finland (Salo, 2008: 169–170). Dean et al. (2006) found E, O and C to be related with simulation-based training, however they did not predict the results of paper and pencil exams.

Despite the somewhat controversial results from previous studies and based on the discussion above, our first proposition is (P1): *Personality traits are significantly related to training performance, more precisely O, E, A, C positively and N negatively*.

Military Morale

Military morale is generally seen as an influential contributor to performance (for instance, Manning, 1991; Britt & Dickinson, 2006), however it has been conceptualised and measured in many different ways (Manning, 1991; Hardy, 2009: 17–20; Fennell, 2014). We used the definition originally proposed by Manning (1991: 455) which states that military morale is "a state of mind giving a service member energy directing her/him towards more qualitative performance in stressful conditions, as enthusiasm and persistence with which a member of a group engages in the prescribed activities of that group" and also used the conceptualisation of it developed by van Boxmeer et al. (2007). They proposed work engagement (WE) as a positive side of morale ("a positive, fulfilling, work-related state of mind that is characterized by vigour and dedication" (Schaufeli & Bakker, 2004: 4)) and burnout (BO) as a negative side ("a persistent, negative, work-related state of mind in otherwise 'normal' individuals, characterised by cynicism and exhaustion" (Schaufeli & Enzmann, 1998: 36)).

Generally, WE (positively) and BO (negatively) are found as predictors of performance in and outside of a military context (for instance van Boxmeer

et al., 2010; van Boxmeer et al., 2011; Bal & De Lange, 2015; Sekhar, Patwardhan & Vyas, 2017; Christian, Garza, & Slaughter, 2011). However, quality training is considered as prerequisite for high military morale (van 't Wout & van Dyk, 2015; Lee, 2017). These findings lead to the conclusion that military morale could be related to military training in two ways: 1) successful training leads to higher morale; 2) high morale creates the prerequisites for successful training. Thus, our second proposition is (P2): *Military morale is positively and burnout negatively related to the conscripts' training performance*.

Positive and negative affectivity

Another psychological construct, which generally might have an impact on the variables of organisational life and therefore on performance, is affectivity. This is considered to be a relatively stable trait which inclines individuals towards a negative or positive mood towards their experiences (Watson & Clark, 1992). Positive affectivity (PosA) reflects the existence of several pleasant emotions (Watson & Clark, 1992) and generally enhances the variety of positive outcomes of an organisational context (Carver & Scheier, 2003). At the same time, negative affectivity (NegA) describes the aspects of emotional experience which are related to tension or dissatisfaction (Rogers & Revelle, 1998). Literature makes a difference between trait and state affectivity (for instance, summarized by Geiger, Lee & Geiger, 2019); the latter refers to feelings and emotions that are either situation- or time-dependent, while the former rather refers to inheritable and relatively stable individual traits. Dalal (2005), Kaplan et al. (2009), Shockley et al. (2012) and Geiger, Lee & Geiger (2019), all using a meta-analytical approach, found that both PosA and NegA predicted task and contextual performance. Moreover, Pasco et al. (2011) found a positive relation between positive affectivity and physical activity.

We found no literature exploring affectivity as a predictor of training performance in a military setting. However, based on parallels from the learning literature (for instance, Lyubomirsky et al., 2005; King et al., 2015) and taking affectivity as a relatively stable trait (Watson & Clark, 1992), we could argue that higher positive affectivity leads to higher confidence, optimism, self-efficacy, striving for new goals and to the acquisition of learning skills and resources among conscripts from the basic training course; All of this could support success in training reflected by the test results. Therefore, we argue that those conscripts who are inclined to view their basic training experience through a negative prism (high in NegA) are not able to take tests as successfully as those conscripts who mostly view their training experience through

a positive prism (high in PosA). Thus, following this line of reasoning, our third proposition is (P3): *Positive affectivity is positively and negative affectivity is negatively related to training performance*.

General Self-Esteem

Self-esteem is generally conceptualised as one of the most important parts of the self-concept (Cast & Burke, 2002). Generally, it reflects an individual's overall evaluation of the self (Rosenberg et al., 1995) and consists of two components: firstly, competence, i.e., the degree to which people see that they are capable and efficacious; and secondly, worth, i.e., the degree to which people feel they are persons of value. It has been claimed that persons having high general self-esteem adapt easily in stressful environments because they have the idea of believing in themselves (Martínez-Martí, & Ruch, 2016).

Relations between general self-esteem and academic performance have been widely researched, however the results had been somewhat controversial (as summarised by Pullmann & Allik, 2008), starting with a strong relation and ending up with no statistically significant relation. Generally, it is positively correlated with academic performance (as summarised by Baumeister et al., 2003) and with job and task performance (summarised by Krauss & Orth, 2022). In addition, Spence, McGannon and Poon (2005) found a small yet significant effect of physical exercise on general self-esteem, demonstrating a spiral-shape relationship. Thus, based on the findings above, we assumed a positive relationship between general self-esteem and conscripts' training performance. Our fourth proposition is therefore (P4): *Conscripts with high general self-esteem perform better in soldiers' basic course examinations*.

Person-organisation fit

The construct of person-organisation fit stems from wider conceptualisation of relations between the individual and environmental characteristics (Muchinsky & Monahan, 1987), being one of the three types of fit in work settings. It describes how well individual interests, values and needs match organisational characteristics such as organisational culture (Werbel & DeMarie, 2005): in our case, how well individuals (conscripts) match the organisational (EDF) values and principles. Kristof (1996) has stated, "compatibility between people and organisations occurs when at least one entity provides what the other needs or they share similar fundamental characteristics or both". For instance, candidates for the Norwegian Military

Academy having a higher concurrence with armed forces values did better in entrance exams (Sørlie et.al, 2020). Thus, we might conclude that different types of organisations suit different individuals and this consistency could be associated with the performance-related outcomes. As stated by Kristof-Brown et al. (2005), value congruence has become "widely accepted as the defining operationalisation of P-O fit". Thus, the person-organisation fit, especially from the consistent values perspective, could also support performance in organisations (Sørlie et.al, 2020). In our case, that would mean the higher the suitability of the conscript's values with the values of the EDF as an organisation, the more he/she will be ready to contribute, including to his/her own effort in training. Therefore, our fifth proposition will be (P5): *Conscripts with higher perceived person-organisation fit perform better in soldiers' basic training.*

Self-Regulatory focus

Higgins (1997) has proposed the theory of regulatory-focus to explain the human motivation distinguishing two modes of motivational regulation: promotion and prevention. Promotion regulatory-focus emphasizes attention to desires and potential gains, and prevention regulatory-focus focuses on attention to obligations and potential losses. Higgins (1998) summarised it as "these different ways of regulating pleasure (promotion) and pain (prevention) have a major impact on people's feelings, thoughts, and actions that are independent of the hedonic principle per se". These ways of regulating motivation might lead to different strategies (to achieve vs. to avoid) to attain work results or to learn from the schools or training events (Yasuda & Goegan, 2023). Moreover, when participants feel the value of what they are learning, the results will be better (Eccels & Wigfield, 2020).

Generally, promotion focus will be related to positive work-related outcomes (such as task performance, organisational citizenship behaviour) and prevention focus will be uniquely related to negative work-related outcomes (for instance, counterproductive work behaviour) (Gorman et al., 2012; Lanaj, Chang & Johnson, 2012). At the same time, some researchers have found that promotion and prevention self-regulatory focus both enhance employee task performance (Choi, Cheong & Lee, 2019; Johnson, Shull & Wallace, 2010). Świątkowski & Dompnier (2020) found that prevention focus negatively affects students learning in academic environments. However, despite the somewhat controversial results from the literature, we think that, as promotion focus is associated with somebody's ability to achieve positive work

results, it will be relevant to expect positive relations between it and success in military training. At the same time, prevention focus concentrates on the avoidance of unpleasant situations/negative work outcomes, so could lead to either a negative or neutral relationship with training performance. Therefore, the sixth proposition will be (P6): *Conscripts with high promotional self-regulatory focus perform better compared with those with high prevention self-regulatory focus*.

Leadership self-efficacy

The concept of self-efficacy was defined by Bandura (1994: 72) as an individual's belief about her/himself to achieve expected results, with the aim to control surrounding events which influence their lives. This belief in one's own abilities has an impact on the way of feeling, thinking, motivating and behaving. Self-efficacy can be divided into two parts (Bandura, 1997): general and task-specific self-efficacy. The latter reflects an individual's perception about his/her ability to perform within a certain context. Our study is interested in leadership self-efficacy (Paglis, 2010) as a task-specific variable reflecting soldiers' belief to act in the field of leadership within their service. This particular choice is justified by the fact that approximately half of the conscripts included in the study will be selected for the role of leaders for their further service. Self-efficacy has been widely researched as a contributor of work-related performance (Judge & Bono, 2001; Judge et al., 2007), also drawing some evidence from military (Fosse et al., 2015) and academic environments (for instance Galyon et al., 2012; Honicke & Broadbent, 2016). This relationship is found to be stronger if tasks required for performance are complicated and complex (Hysong & Quiñones, 1997).

The construct of leadership self-efficacy has generally followed the same pattern of relations as general self-efficacy (summarised by Paglis, 2010 and Dwyer, 2019), so it is positively related to the (leadership) performance related indicators. Based on data from the Estonian Defence Resources Agency (Kaitseressursside Amet), we claim that the choice of whether to become a military leader during conscription service is largely made voluntarily before the service begins (for instance, whether to serve 11 or 8 months). Therefore, we can assume that a large part of conscripts serving 11 months wish to pass training successfully because their further assignment depends on it. This motivation could also be reflected in their training performance. Therefore, taking into account that the majority of those conscripts who are called into service in the preliminary wave will follow the path of the leader's training,

it might be relevant to assume that *soldiers with high leadership self-efficacy perform better during their soldiers' basic training* (P7).

Socio-demographic variables

Taking into account the context of conscription service, we assumed that some socio-demographic characteristics might be interesting to analyse in the context of performance as independent variables. Some papers to support that claim have been published previously. For instance, Fosse et al. (2015) found a positive correlation between age and military and academic performance; Müürsoo (2018) demonstrated differences in attitudes by mother tongue; Kasemaa & Säälik (2021) found relations between age, mother tongue, education, place of residence and military morale among Estonian conscripts; Salo (2008: 172) showed relations between education, age and attrition from Finnish conscription service; Tooding (2021) found relations between mother tongue, education and place of residence as predictors of physical tests among Estonian conscripts.

Thus, we were interested in the impact of age, mother tongue, education, place of residence and student status in the context of performance, however we did not have specific propositions. We followed the logic that more educated conscripts could grasp the content of the soldiers' basic training better than less educated conscripts, which could also be reflected in the results of the exams. At the same time, those conscripts who are older and perhaps have student status are not as motivated to participate in service, so their exam results could be somehow influenced by that. The same applies to the mother tongue; perhaps those service members speaking a language other than Estonian as their mother tongue would achieve lower training results, for instance, due to lower attitudes toward the service as was demonstrated by Müürsoo (2018).

3. Method

Research Sample

Conscription service in Estonia is divided into two time slots, the first lasting 11 months and intended mostly for leaders, and the second for 8 months and mostly for privates. The majority of conscripts for 11 months have at least secondary education; some of them are students in different higher education institutions (by law, they take academic leave for the time of their service).

A sample of 241 Estonian conscripts from 11-month time slots who were part of an 8-week Soldiers' Basic Training Course (SBTC) participated in the study with a mean age of 21.56 (SD = 1.54). They consisted of four female and 237 male soldiers. The majority of them reported their mother tongue as Estonian (n = 226) and 16 Russian. By education, two respondents had passed basic education, 166 had finished secondary school, 39 had graduated from a higher educational institution and 44 participants did not mention their level of education; 49 respondents reported their status as 'student'. By place of residence, 75 had come from the countryside, 31 from townships, 48 from small towns, 14 from county centres and 73 from major towns.

Instruments

Reliability figures (*Cronbach α*) and descriptive statistics (mean and *SD*) are presented in Table 2.

The Big Five personality traits were measured by the Soldiers' Personality Questionnaire (SPQ-40) developed by Parmak, Mylle & Konstabel (2013) and subsequently used by Kasemaa & Säälik, 2021. This 40-item instrument measures openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (8 items per trait) and was developed for the use of the Estonian military. A four-point Likert scale was used ranging from very inaccurate (1) to very accurate (4) and the respondents rated to what extent the following 40 statements were applicable to them.

For military morale we used a 16-item instrument developed by Boxmeer et al. (2007) which consists of two dimensions (eight items each) and four components (four items each). The first dimension (military morale) was formed by dedication and vigour, and second dimension (burnout) by cynicism and exhaustion. In general, the origin of this instrument was intended to measure both the positive and negative sides of well-being (Schaufeli et al., 2002); it was translated into Estonian by Parmak (2010). A five-point Likert-type scale was used for the answers, ranging from never (1) to always (5).

Positive and negative affectivity was measured by a 20-item instrument (Watson, Clark, & Tellegen, 1988): ten items asking about positive and ten items about negative emotions (for example cheerful, energetic, lively, or dispirited, ill-humoured, nervous). This instrument was adapted into the Estonian language by Allik & Realo (1997) and used in several follow-up studies (Kööts, Realo & Allik, 2011). Respondents were asked to assess each expression and decide to what extent they have felt this way over the past two weeks. A five-point Likert scale was used, ranging from very little (1) to very high (5).

General self-esteem was measured by the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) which was adapted into Estonian by Pullmann & Allik (2000). Items were answered using a five-point Likert scale starting from 1 (strongly disagree) and ending with 5 (strongly agree).

Perceived Person-Organisation fit was measured by 3 items which were originally published by Cable & Judge (1996). A five-point Likert type scale was used for answers ranging from not at all (1) to completely (5). This scale has proved to be a reliable instrument for measuring the value concurrence between individuals and organisations and has been extensively used in subsequent studies (for instance, Verquer, Beehr, & Wagner, 2003).

Since this article is focused on individual differences, the questionnaire proposed by Higgins et al. (2001) was used to collect data about the self-regulatory focus. This instrument measures rather chronic and dispositional tendencies of self-regulatory focus which have been developed throughout a lifetime. A five-point Likert scale was used for answers from never or seldom (1) to very often (5).

Leadership self-efficacy (LSE) was measured using a six-item scale developed by Feasel (1995; in Chan and Drasgow, 2001) and modified by Chan and Drasgow (2001). This instrument was translated into Estonian by Kasemaa (2016). A seven-point Likert-type scale was used for answers from strongly disagree (1) to strongly agree (7).

Performance was measured by the results of the soldiers' final exam at the end of the SBTC. The exam consisted of three different elements: 1) theoretical: paper and pencil test to measure military knowledge, such as formations, hand signs, unit history, etc.; 2) practical: several exercises on the field, such us first aid, orienteering, shooting, positioning, etc.; 3) physical fitness: push-ups, sit-ups and a 3.2 km run. All tests included several subtasks which were evaluated by points, however the scales for exam elements were not comparable. For instance, the minimum result was 0 and maximum 300 for the physical test, 38 and 88 for theory, and 0 and 12 for practice. Nevertheless, to maintain comparability all test results were divided into groups such that each group consisted of a more or less equal number of participants. So, the final performance variables were transformed to an ordinal scale from 1 (low performance) to 3 or 4 (high performance). Additionally, the summarised performance indicator was used (averaged sum of theory, practice and fitness) as a variable to reflect general performance on the SBTC test.

Several socio-demographic variables were asked for (see Table 1 for breakdown), such as education (basic, secondary and higher), age (defined into two age groups), sex (male or female), mother tongue (Estonian, Russian and

others), university student status (yes or no), and place of dwelling ('most of my life I have lived…'). All mentioned variables were used as categorical in subsequent analyses.

Table 1. Socio-demographic variables and performance

	Education		Place of residence				Language		Student		Age	
	(1)	(2)	(1)	(2)	(3)	(4)	(1)	(2)	(1)	(2)	(1)	(2)
Theory												
Low	72	4	25	10	19	22	72	4	9	67	25	51
Rather low	45	9	15	7	11	21	50	4	10	44	25	29
Rather high	49	16	22	10	13	20	62	3	11	54	22	43
High	36	10	13	4	5	24	42	4	19	27	23	23
Practical												
Low	33	4	11	2	12	12	35	2	4	33	14	23
Average	141	29	59	26	29	56	160	10	32	138	65	105
High	28	6	5	3	7	19	31	3	13	21	16	18
Physical												
Low	53	6	16	12	12	19	57	2	8	51	17	35
Rather low	57	6	25	7	8	23	61	2	12	51	23	40
Rather High	43	19	19	7	17	19	56	6	13	49	22	40
High	49	8	15	5	11	26	52	5	16	41	30	27
Summary												
Low	35	2	11	5	12	9	35	2	4	33	12	25
Rather low	64	7	24	11	11	25	68	3	9	62	23	48
Rather high	53	20	24	12	12	25	69	4	16	57	32	41
High	50	10	16	3	13	28	54	6	20	40	28	32

Note. Codes for: a) education: 1 – Basic or secondary, 2 – Higher; b) place of residence: 1 – countryside, 2 – boroughs, 3 – small towns, 4 – major towns; c) language: 1 – Estonian, 2 – others; d) student status: 1 – student, 2 – not a student; e) age: 1 – lower age group (m = 20.02, SD = .89), 2 – higher age group (m = 22.57, SD = 0.92).

Procedure

The data was collected at the end of the three-month SBTC (the first training course for conscripts) in classrooms using a paper and pencil approach. After providing informed consent, participants filled out their questionnaires. Participation was voluntary and all respondents were given the opportunity to interrupt completing the questionnaire at any time during the process.

Data analyses

To select variables for logistic regression models and assess the pattern of relations between study variables and the performance indicators, nonparametric zero order correlations (*Spearman ρ*) were calculated. Secondly, the Kruskal-Wallis test was used to assess the mean differences of respondents' study variables across the performance categories (from 1 to 3 or 4). Effect sizes were calculated using a formula by Tomczak & Tomczak (2014): $E^2_r = H/(n2 -1)/(n+1)$ (E – epsilon; H – Kruskal-Wallis test statistic; n – sample size). We used guidance proposed by Rea & Parker (2014: 219) and squared the upper and lower bounds of each bin to get interpretations, which are: 0.00 – 0.01 negligible, 0.01 – 0.04 weak, 0.04 – 0.16 moderate, 0.16 – 0.36 relatively strong, 0.36 – 0.64 strong, and 0.64 – 1.0 very strong effect size. In the next stage, we followed recommendations by Osborne (2015) and selected variables for ordinal logistic regression based on the results of both analyses (correlations and mean differences). For this we used statistical significance ($p < 0.05$) as selection criteria. The aim was to find out the best set of psychological and socio-demographic variables (IV) predicting performance (DV) and analyse them all together in ordinal logistic regression models.

Ordinal logistic regression models

Firstly, we included all Big Five personality traits as IVs into the model (M1). Secondly, we added positive and negative affectivity to the personality as indicators of mood (M2), and thirdly the indicators of military morale (M3). The fourth model (M4) involved all other psychological variables such as self-esteem, person-organisation fit, regulatory fit (promotion & prevention) and leadership self-efficacy. For the last model (M5) we added socio-demographic variables. Gradually (separately for all models), we eliminated all those predictors which did not show a statistically significant ($p < 0.05$) contribution predicting one or another performance variable (DVs). Additionally, we used a χ^2 difference test ($p < 0.05$) and change of pseudo R^2 to decide which combination of IVs predicted the best DVs. All models were calculated by Generalized Linear Models (ordinal regression) in SPSS with mixed hybrid parameter estimation.

Assumptions testing for logistic regression

Ordinal regression analysis requires a set of assumptions being met in order to consider the results as reliable (Stoltzfus, 2011; Field, 2013: 768–769): 1) all

DVs need to be ordinal and IVs either categorical or continuous; 2) observations need to be independent of each other (no repeated measurements or matched data); 3) little or no multicollinearity among independent variables (no high correlations between them); 4) linearity of IVs and log odds (linear relationship between any continuous IVs and the logit transformation of the DV); 5) independence of errors (no overdispersion) (Field, 2013: 772); 6) proportional odds (the relationship between each pair of outcome groups has to be the same); 7) no influential outliers (Zhang et al., 2017); 8) additionally, appropriate sample size (Ottenbacher et al., 2004).

The first and second assumptions were checked by descriptive statistics (see Table 1 for precise data). In conclusion, all of our DVs (performance indicators) were in three or four ordinal categories. IVs were either categorical (socio-demographic variables) or continuous (psychological constructs) and all observations were independent from each other, so there were no repeated cases or matched data in our database.

In general, the literature states that logistic regression is the method for relatively large sample sizes. For instance, Hosmer, Lemeshow & Sturdivant (2013: 167) summarised simulation studies and propose $n > 400$ in order to calculate adequate model goodness of fit. Nevertheless, some recent studies simulating sample sizes and the coefficient estimates have concluded that the bias might be less than 2% if the sample size is larger than 200 (Liu et al., 2017). Peduzzi et al. (1996) proposed the rule of thumb 10:1 for binary logistic regression, which means that for every independent variable no fewer than 10 outcomes from smaller groups are required. However, this rule is contested by van Smeden et al. (2016) who found that, for instance, overall sample size matters as well. Nevertheless, we considered a sample $n = 241$ as big enough for subsequent analyses.

The remainder of the assumption checks are presented in the Results section below.

4. Results

Descriptive statistics and correlations

Descriptive statistics and correlations between study variables (continuous) and performance indicators are shown in Table 2. Correlations revealed that openness to experience and leadership self-efficacy were the most important contributors to the summarised performance ($\rho = 0.31$ and 0.29 respectively, $p < 0.01$). However, all three performance components demonstrated

slightly different patterns of correlations. For instance, theoretical performance is highest with openness to experience ($\rho = 0.39$, $p < 0.01$), followed by leadership self-efficacy ($\rho = 0.28$, $p < 0.01$) and general self-esteem ($\rho = 0.22$, $p < 0.01$). Practical performance, on the other hand, is highest with openness ($\rho = 0.21$, $p < 0.01$) and leadership self-efficacy ($\rho = 0.18$, $p < 0.01$), and physical performance is highest with leadership self-efficacy ($\rho = 0.23$, $p < 0.01$) and positive affectivity ($\rho = 0.23$, $p < 0.01$), followed by prevention ($\rho = -0.21$, $p < 0.01$) and promotion regulatory focus ($\rho = -0.20$, $p < 0.01$). It is important to note that agreeableness and neuroticism from the personality side, and dedication and cynicism from military morale, did not demonstrate any significant ($p < 0.05$) correlation with performance indicators.

Table 2. Descriptive statistics and zero order correlations [*Spearman ρ*] of study variables

	Mean	SD	α	Performance			
				Theoretical	Practical	Physical	Summary
Practical Perf	n/a	n/a	n/a	0.39**	–		
Physical Perf	n/a	n/a	n/a	0.27**	0.32**	–	
Summary Perf	2.66	1.02	0.51	0.75**	0.62**	0.75**	–
Openness	3.42	0.49	0.75	0.38**	0.21**	0.08	0.31**
Conscientiousness	3.11	0.48	0.77	0.14*	0.06	0.19**	0.17**
Extraversion	3.17	0.66	0.88	0.13*	0.05	0.16*	0.15*
Agreeable	3.70	0.44	0.80	0.03	0.02	0.09	0.07
Neuroticism	2.17	0.59	0.87	–0.13	–0.06	–0.08	–0.12
Dedication	3.36	0.75	0.79	–0.03	–0.12	0.06	–0.04
Vigour	3.40	0.63	0.66	0.04	0.02	0.15*	0.10
Cynicism	2.84	0.66	0.59	–0.12	–0.02	–0.12	–0.09
Exhaustion	2.70	0.75	0.74	–0.19**	–0.14*	–0.19**	–0.23**
PANAS Pos	3.00	0.74	0.92	0.03	0.10	0.23**	0.17**
PANAS Neg	2.48	0.87	0.90	–0.13*	–0.10	–0.12	–0.14*
General S–E	3.82	0.59	0.85	0.22**	0.11	0.17*	0.23**
POF	2.78	1.03	0.92	0.15*	0.14*	0.17**	0.21**
RF_Prom	3.83	0.51	0.76	0.20**	0.06	0.20**	0.19**
RF_Prev	2.82	0.68	0.83	–0.07	–0.07	–0.21**	–0.16*
LS SE	4.69	1.14	0.83	0.28**	0.18**	0.23**	0.29**

Notes. * – $p < 0.05$; ** – $p < 0.01$; $n = 241$

α – *Cronbach* alpha; Perf – performance; PANAS Pos – positive affectivity; PANAS Neg – negative affectivity; General S-E – General Self-esteem; POF – person-organisation fit; RF Prom – promotion regulatory focus; RF Prev – prevention regulatory focus; LS SE – leadership self-efficacy.

As the next step, a series of non-parametric dispersion analyses (Kruskal-Wallis) were conducted to identify the significant differences in means of psychological variables between the performance groups, and performance by socio-demographic characteristics. The results together with associated effect sizes (E^2r) are presented in Tables 3 and 4. Results demonstrated that the highest effects on performance categories were openness to experience over the theoretical [$E^2r = 0.15$; $H(3) = 35.26$, $p < 0.01$] and summary performance [$E^2r = 0.10$; $H(3) = 23.30$, $p < 0.01$]. The only psychological variable which showed moderate effect (E^2r between 0.04 – 0.16) over all performance categories was leadership self-efficacy. Nevertheless, general self-esteem, promotion regulatory focus and exhaustion had a moderate effect on theoretical performance; positive affectivity, general self-esteem, exhaustion, person-organisation fit, prevention and promotion regulatory focus on physical performance; and exhaustion, general self-esteem, person-organisation fit, promotion regulatory focus and C on summarised performance. Interestingly A, N and dedication did not demonstrate any significant effect on performance.

Among categorical variables, the mother tongue and place of residence did not demonstrate any significant effect over performance. The only categorical variable having moderate effect was student status over the theoretical and summarised performance.

Pre- and post-analysis assumptions check for ordinal logistic regression

Assumption of little or no multicollinearity was controlled by correlation matrix (Spearman ρ), Tolerance (Tol), Variance Inflation factor (VIF) and Eigenvalues (Eign) together with Condition Index (ConIndex). The highest correlation between the DVs was between N & SE ($\rho < -0.61$), which might indicate a problem of multicollinearity. In all models Tol was between 0.366 and 0.774 ($m = 0.515$). This indicates, using a strict cutoff value > 0.02 by Menard (1995), no serious problem of multicollinearity between IVs. Secondly, VIF in all models demonstrated values between 1.291 and 2.731 ($m = 2.019$). Allison (2001: 288) proposed a strict threshold (VIF < 2) as an indicator of an acceptable level of multicollinearity, however O'Brien (2007) found that this threshold might be questionable. We therefore decided to consider VIF values between 1.291 and 2.731 as acceptable. Thirdly, the Eign and ConIndex were examined.

Table 3. Differences in psychological variables by low to high performance groups [Kruskal-Wallis test]

Variable	*n*	Theoretical Performance			Practical Performance			Physical Performance			SUM of Performance		
		H(df)	$p^{\star}$	$E_r^{2\star\star}$	H(df)	$p^{\star}$	$E_r^{2\star\star}$	H(df)	$p^{\star}$	$E_r^{2\star\star}$	H(df)	$p^{\star}$	$E_r^{2\star\star}$
Personality (DV)													
Openness	241	35.26(3)	0.000	0.147	11.12(2)	0.004	0.046	2.19(3)	0.533	0.009	23.30(3)	0.000	0.097
Conscientiousness	241	8.40(3)	0.038	0.035	0.92(2)	0.632	0.004	9.69(3)	0.021	0.040	10.53(3)	0.015	0.044
Extraversion	241	5.77(3)	0.123	0.024	1.92(2)	0.382	0.008	7.65(3)	0.054	0.032	5.20(3)	0.158	0.022
Agreeableness	241	0.38(3)	0.944	−0.002	0.12(2)	0.942	0.000	3.35(3)	0.340	0.014	3.29(3)	0.349	0.014
Neuroticism	241	5.74(3)	0.125	0.024	1.07(2)	0.587	0.004	2.99(3)	0.394	0.012	3.72(3)	0.293	0.016
Military Morale (DV)													
Dedication	239	1.63(3)	0.653	0.007	3.55(2)	0.170	0.015	2.76(3)	0.430	0.012	1.97(3)	0.578	0.008
Vigour	240	1.48(3)	0.688	0.006	0.10(2)	0.953	0.000	7.05(3)	0.070	0.029	3.77(3)	0.287	0.016
Cynicism	238	5.04(3)	0.169	0.021	0.28(2)	0.869	0.001	7.22(3)	0.065	0.030	8.64(3)	0.035	0.036
Exhaustion	238	10.59(3)	0.014	0.045	5.01(2)	0.081	0.021	12.92(3)	0.005	0.055	16.41(3)	0.001	0.069
Affectivity (DV)													
Positive Affectivity	234	1.78(3)	0.619	0.008	2.61(2)	0.271	0.011	15.06(3)	0.002	0.065	8.08(3)	0.044	0.035
Negative Affectivity	233	9.09(3)	0.025	0.039	2.32(2)	0.314	0.010	6.30(3)	0.098	0.027	6.56(3)	0.087	0.028
Other psychological variables (DV)													
General Self-Esteem	241	12.48(3)	0.006	0.052	3.34(2)	0.189	0.014	14.31(3)	0.003	0.060	14.50(3)	0.002	0.060
POF	240	8.12(3)	0.044	0.034	5.16(2)	0.076	0.022	9.54(3)	0.023	0.040	12.99(3)	0.005	0.054
Promotion RF	240	12.39(3)	0.006	0.052	1.12(2)	0.571	0.005	11.20(3)	0.011	0.047	10.14(3)	0.017	0.042
Prevention RF	239	2.44(3)	0.486	0.010	1.61(2)	0.448	0.007	10.93(3)	0.012	0.046	8.84(3)	0.031	0.037
Leadership SE	241	20.42(3)	0.000	0.085	8.90(2)	0.012	0.037	18.33(3)	0.000	0.076	22.27(3)	0.000	0.093

Notes. * – asymptotic significance; ** – formula for effect size: $E_r^{2\star\star}$= H/(n2 –1)/(n+1) (H – Kruskal-Wallis test statistic; n – sample size) (Tomczak & Tomczak, 2014); DV – dependent variable.

Table 4. Differences in performance by socio-demographic variables (Kruskal-Wallis test)

Variable (IV)	*n*	Theoretical Performance			Practical Performance			Physical Performance			SUM of Performance		
		H(df)	p^*	E_r^{2**}	H(df)	p^*	E_r^{2**}	H(df)	p^*	E_r^{2**}	H(df)	p^*	E_r^{2**}
Mother tongue	241	0.21(1)	0.646	0.001	0.37(1)	0.562	0.001	2.66(1)	0.103	0.011	1.34(1)	0.248	0.006
Education	241	9.09(1)	0.003	0.038	0.64(1)	0.422	0.003	2.64(1)	0.104	0.011	4.85(1)	0.024	0.020
Place of Residence	241	5.15(3)	0.191	0.021	5.26(3)	0.154	0.022	3.93(3)	0.269	0.016	4.84(3)	0.184	0.020
Student status	241	11.05(1)	0.001	0.046	7.97(1)	0.005	0.033	3.66(1)	0.056	0.015	10.42(1)	0.001	0.043
Age	241	1.71(1)	0.191	0.001	0.59(1)	0.443	0.000	3.97(1)	0.046	0.017	3.66(1)	0.056	0.015

Notes. * – asymptotic significance; ** – formula for effect size: E_r^2 = H/(n2 –1)/(n+1) (Tomczak & Tomczak, 2014); H – Kruskal-Wallis test statistic; n – sample size; IV – independent variable.

Despite a lack of consensus about the cutoff value (Field, 2013: 796), results led to the conclusion that both Eign and ConIndex were similar enough to demonstrate no significant multicollinearity (Eign between 0.002 and 0.320 and ConIndex between 7.121 & 89.392), however ConIndex values > 30 might be problematic (Kim, 2019). Variance proportions confirmed our general conclusion: no remarkable proportions (cutoff > 0.50; Belsley, Kuh & Welsch, 1980: 112–113) of more than one predictor were associated on the same Eign.

The assumption of linear relationship between any continuous IVs and the logit transformation of the DV was tested by adding the predictors that are the interaction between each predictor and the log of itself into the logistic regression model (Hosmer, Jovanovic & Lemeshow, 1989; Box & Tidwell, 1962). All interactions were statistically non-significant ($p > 0.05$), thus indicating that the assumption of linearity of independent variables and log odds had been met.

The presence of overdispersion/underdispersion was calculated by the value of model χ^2/df (Field, 2013: 772). The values indicated no under/overdispersion (χ^2/df = between 0.978 for practical and 1.040 for physical performance).

The assumption of proportional odds (Osborne, 2015: 147) was tested by a full likelihood ratio test comparing the fitted location model to a model with varying location parameters (in SPSS Test of Parallel Lines). All final models demonstrated non-significant χ^2 ($p > 0.05$), indicating that the relationships between each pair of outcome groups was the same so the assumptions of proportional odds had been met.

To detect any influential outliers (Field, 2013: 790), the Cook's distance, leverage, standardised, studentised residuals and Mahalanobis distances were used for all final models. In general, all cases fell within the limit of absolute thresholds (see Table 5), however several cases fell above the sample adjusted cutoff values recommended by the literature. No specific reason to deviate was found after careful examination of all those cases, so we followed the suggestion made by Field (2013: 791) and kept them in the analyses.

Table 5. Analyses of outliers and influential cases

	Cook's distance	Leverage	Stand DFIT	Stand DFBETA	Studentized residuals	*p* (Mahalanobis distance)
Influence on the model	High influence on overall model	High influence on overall model	High influence on overall model	High influence on individual parameters	Potential residual outliers (high discrepancy/distance)	Cases with extreme values on predictors (high leverage)
Absolute threshold	> 1	Close to (k+1)/n	> 2 (abs value)	> 2 (abs value)	> 3 (abs value)	< 0.001
Sample-adjusted threshold	4/(n-k–1)	2(k+1)/n	2Φ (k+1)/n	2/Φ n	n/a	n/a
Threshold for the study	> 0.0183	> 0.0952	> 0.4364	> 0.1316	n/a	n/a
Reference	Fox, 2016, p. 282; Cook, 1977	Hoaglin & Welsch, 1978	Bollen & Jackman, 1990, p. 266	Belsley, Kuh & Welsch, 1980, p. 28	Fox, 2016, p. 281	Tabachnick & Fidell, 2007, p. 99
Results	8 cases	11 cases	9 cases	3 cases	No cases over absolute threshold, less than 5% > 2	2 cases over absolute threshold
Outcome	No cases were deleted due to the results of the analyses of outliers and influential cases					

Note. n = 231; k = 11 (max number of IVs throughout all models); Stand DFIT – standardised difference between the predicted value for a case when the model is calculated including that case vs. case is excluded; Stand DFBETA – standardised difference between a parameter estimated using all cases when one case is excluded.

Ordinal logistic regression models predicting performance

To find the best set of psychological and socio-demographic variables predicting performance, ordinal logistic regression analyses were used. All four final models analysed (Tables 6–9) demonstrated good model fit; Pearson chi-square and residual statistics tests (Hosmer et al., 1997) were non-significant for all models presented.

The first model predicted theoretical performance and after several respecifications the final model [$\chi^2(6) = 63.39$, $p = 0.000$] included openness to experience ($\beta = 1.31$), positive affectivity ($\beta = -0.41$), general self-esteem ($\beta = 0.54$), person-organisation fit ($\beta = 0.34$), student status ($\beta = 0.83$) and education ($\beta = -0.95$) as statistically significant ($p < 0.05$) predictors of theoretical performance (Table 6). Model Pseudo R^2 demonstrated values between 0.10 (McFadden) and 0.25 (Nagelkerke) and it predicted correctly in 40% of cases.

Table 6. Ordinal logistic regression to predict theoretical performance

Predictor (IV)	B	S.E.	Wald's χ^2	*df*	*p*	Exp(B)	95% C.I. for Exp(B)	
							Lower	Upper
DV: Theoretical performance (n = 234)								
Theor Perform (1)[1]	4.65	1.14	16.59	1	0.000	104.38	11.15	976.90
Theor Perform (2)[1]	5.80	1.16	24.95	1	0.000	328.60	33.82	3193.26
Theor Perform (3)[1]	7.33	1.19	37.87	1	0.000	1523.11	147.60	15717.41
Openness	1.31	0.28	21.74	1	0.000	3.71	2.14	6.44
Pos Affectivity	–0.41	0.21	3.90	1	0.048	0.66	0.44	1.00
General S-E	0.54	0.25	4.73	1	0.030	1.71	1.05	2.77
Pers-Org Fit	0.34	0.14	5.99	1	0.014	1.40	1.07	1.84
Education[2]	–0.95	0.33	8.57	1	0.003	0.39	0.20	0.73
Student[2]	0.83	0.32	6.68	1	0.010	2.29	1.22	4.29
		–2 log	χ^2	*df*	*p*			
Model fit (final)		578.07	63.39[3]	6	0.000			
Goodness of Fit: Pearson		n/a	689.98	693	0.525			
Goodness of Fit: Deviance		n/a	578.07	693	0.999			
Test of Parallel Lines		562.91	15.16	12	0.233			
Pseudo R^2 = 0.237 (Cox & Snell) 0.254 (Nagelkerke) 0.099 (McFadden)								
Correctly predicted cases (%) Low 69, Rather Low 0, Rather High 47, High 29.								

Notes. 1 – threshold (cut-off value) between DV response categories; 2 – binary variable; 3 – Likelihood Ratio $\chi 2$; Theor Perform – low (1), rather low (2), rather high (3), high (4) (reference category); Education – basic and secondary (1), higher (2); Student status –student (1), not a student (2); n/a – not applicable; Exp(B) – odds ratio.

The second model predicted practical performance; after analysis of several combinations of IVs, the final model [$\chi^2(5) = 29.52$, $p = 0.000$] included openness to experience ($\beta = 0.72$), dedication ($\beta = -0.62$), person-organisation fit ($\beta = 0.32$) and student status ($\beta = 0.75$) as statistically significant ($p < 0.05$) predictors of practical performance (Table 7). Model Pseudo R^2 showed values between 0.08 (McFadden) and 0.15 (Nagelkerke) and it predicted correctly in 70% of cases.

Table 7. Ordinal logistic regression to predict practical performance

Predictor (IV)	B	S.E.	Wald's χ^2	*df*	*p*	Exp(B)	95% C.I. for Exp(B)	
							Lower	Upper
DV: Practical performance (n = 238)								
Pract Perform (1)[1]	–1.49	1.64	.82	1	0.364	0.23	0.01	5.61
Pract Perform (2)[1]	2.41	1.65	2.13	1	0.144	11.09	0.44	280.77
Openness	0.72	0.31	5.46	1	0.019	2.05	1.12	3.74
Dedication	–0.62	0.22	8.02	1	0.005	0.54	0.35	0.83
Exhaustion	–0.37	0.22	2.89	1	0.089	0.69	0.45	1.06
Pers-Org Fit	0.32	0.15	4.39	1	0.036	1.38	1.02	1.87
Student[2]	0.75	0.36	4.22	1	0.040	2.11	1.04	4.31
		–2 log	χ^2	*df*	*p*			
Model fit (final)		354.72	29.52[3]	5	0.000			
Goodness of Fit: Pearson		n/a	448.96	459	0.622			
Goodness of Fit: Deviance		n/a	350.56	459	1.00			
Test of Parallel Lines		352.95	1.77	5	0.880			
Pseudo R^2 = 0.117 (Cox & Snell) 0.145 (Nagelkerke) 0.076 (McFadden)								
Correctly predicted cases (%) Low 3 Average 99 High 3.								

Notes. [1] – threshold (cut-off value) between DV response categories; [2] – binary variable; [3] – Likelihood Ratio χ^2; Pract Perform – low (1), rather low (2), rather high (3), high (4) (reference category); Education – basic and secondary (1), higher (2); Student status –student (1), not a student (2); n/a – not applicable; Exp(B) – odds ratio.

Thirdly, the final model [$\chi^2(6) = 45.93$, $p = 0.000$] predicting physical performance included positive and negative affectivity ($\beta = 0.74$ and 0.47 respectively), leadership self-efficacy ($\beta = 0.35$), prevention regulatory focus ($\beta = -0.67$), education ($\beta = -1.16$) and age ($\beta = 0.67$) as statistically significant ($p < 0.05$) predictors of physical performance (Table 8). Model Pseudo R^2 demonstrated values between 0.07 (McFadden) and 0.20 (Nagelkerke) and it predicted correctly in 39% of cases.

Table 8. Ordinal logistic regression to predict physical performance

Predictor (IV)	B	S.E.	Wald's χ^2	*df*	*p*	Exp(B)	95% C.I. for Exp(B)	
							Lower	Upper
DV: Physical performance (n = 226)								
Physic Perform (1)[1]	0.99	1.06	0.89	1	0.346	2.70	0.34	21.38
Physic Perform (2)[1]	2.38	1.06	5.02	1	0.025	10.75	1.35	85.91
Physic Perform (3)[1]	3.70	1.08	11.84	1	0.001	40.52	4.92	333.61
Positive Affect	0.74	0.22	11.57	1	0.001	2.10	1.37	3.23
Negative Affect	0.47	0.18	6.64	1	0.010	1.60	1.12	2.29
LS Self-Efficacy	0.35	0.13	7.60	1	0.006	1.42	1.11	1.81
Prevention RF	–0.67	0.20	11.60	1	0.001	0.51	0.35	0.75
Education[2]	–1.16	0.34	11.49	1	0.001	0.31	0.16	0.61
Age[2]	0.67	0.28	5.80	1	0.016	1.95	1.13	3.36
		–2 log	χ^2	*df*	*p*			
Model fit (final)		579.793	45.93[3]	6	0.000			
Goodness of Fit: Pearson		n/a	695.81	669	0.229			
Goodness of Fit: Deviance		n/a	579.79	669	0.994			
Test of Parallel Lines		559.092	20.70	12	0.055			
Pseudo R^2 = 0.184 (Cox & Snell) 0.196 (Nagelkerke) 0.073 (McFadden)								
Correctly predicted cases (%) Low 45, Rather Low 40, Rather High 25, High 46.								

Notes. [1] – threshold (cut-off value) between DV response categories; [2] – binary variable; [3] – Likelihood Ratio χ^2; Physic Perform – low (1), rather low (2), rather high (3), high (4) (reference category); Education – basic and secondary (1), higher (2); Age – (1) lower age group (m = 20.02, SD = 0.89), (2) higher age group (m = 22.57, SD = 0.92).; n/a – not applicable; Exp(B) – odds ratio.

The fourth model predicted summarized performance; after analysing all possible combinations of the predictors, the final model [$\chi^2(6) = 58.21$, $p = 0.000$] included openness of experience ($\beta = 0.61$), person-organisation fit ($\beta = 0.25$), leadership self-efficacy ($\beta = 0.32$), education ($\beta = -0.89$) and student status ($\beta = 0.75$) as statistically significant ($p < 0.05$) predictors of summarized performance (Table 9). Model Pseudo R^2 demonstrated values between 0.09 (McFadden) and 0.23 (Nagelkerke) and it predicted correctly in 38% of cases.

Table 9. Ordinal logistic regression to predict summarized performance

Predictor (IV)	B	S.E.	Wald's χ^2	*df*	*p*	Exp(B)	95% C.I. for Exp(B)	
							Lower	Upper
DV: Summarized performance (n = 238)								
Sum Perform (1)[1]	0.70	1.08	.42	1	0.516	2.02	0.24	16.92
Sum Perform (2)[1]	2.46	1.10	5.04	1	0.025	11.07	1.37	100.31
Sum Perform (3)[1]	4.02	1.11	13.08	1	0.000	55.64	6.30	491.00
Openness	0.61	0.28	4.75	1	0.029	1.84	1.06	3.17
Pers-Org Fit	0.25	0.12	4.24	1	0.040	1.29	1.02	1.64
LS Self-Efficacy	0.32	0.13	6.47	1	0.011	1.38	1.08	1.78
Education[2]	–0.89	0.33	7.33	1	0.007	0.41	0.22	0.78
Student[2]	0.75	0.32	5.81	1	0.016	2.13	1.15	3.93
		–2 log	χ^2	*df*	*p*			
Model fit (final)		587.61	58.21[3]	6	0.000			
Goodness of Fit: Pearson		n/a	727.71	705	0.269			
Goodness of Fit: Deviance		n/a	587.61	705	1.000			
Test of Parallel Lines		573.43	14.18	12	0.290			
Pseudo R^2 = 0.217 (Cox & Snell) 0.232 (Nagelkerke) 0.090 (McFadden)								
Correctly predicted cases (%) Low 16, Rather Low 49, Rather High 36, High 41.								

Notes. [1] – threshold (cut-off value) between DV response categories; [2] – binary variable; [3] – Likelihood Ratio χ^2; Sum Perform – low (1), rather low (2), rather high (3), high (4) (reference category); Education – basic and secondary (1), higher (2); Student status – student (1), not a student (2); n/a – not applicable; Exp(B) – odds ratio.

5. Discussion

The aim of the study was to find a set of psychological and socio-demographic variables which have an impact on the performance measured by the final exam results of the soldiers' basic training. We believe that our results contribute to the wider discussion on the relations between training performance and psychological variables in the military environment.

Our first hypotheses reflected personality performance relationships. Zero-order correlations demonstrated no statistically significant relations between agreeableness and neuroticism and performance (all indicators), while extraversion and conscientiousness showed weak correlation with some performance indicators. However, openness to experience was the most correlated with performance (except physical). These results were to some extent replicated by the Kruskal-Wallis test, keeping the effects of openness to

experience and conscientiousness as significant and the rest of the personality traits as not significant. Generally, these results were in line with some previous findings (Barrick, Mount & Judge, 2001 and Judge et al., 2007), however they differed in neuroticism and agreeableness. Therefore, we concluded that the first proposition had been partially confirmed. Individuals high in openness to experience generally have positive attitudes towards learning and new experiences (McCrae & Costa, 2008), so those conscripts were most likely willing to engage in the training that conscription offers, despite the fact that conscription service itself was compulsory for them. At the same time, results related to neuroticism and agreeableness were somewhat surprising but could be explained by the selection for the 11-month service path (the most neurotic persons were wiped out) and by the nature of the training because this course was largely focused on individual training which could not allow agreeableness to support it. Barrick & Mount (1991) found that the predictive validity of extraversion and consciousness is greater in jobs high in autonomy compared to jobs low in autonomy, which could help explain weak relations between extraversion and consciousness and training performance.

Our second proposal anticipated relations between the components of military morale and training performance. Zero-order correlations revealed that dedication from the engagement side and cynicism from the burnout side did not have significant relations to performance indicators. At the same time, the K-W test demonstrated that exhaustion differed statistically significantly in groups with different theoretical, physical and summarised performance, and cynicism in groups with different summarised performance. So, our second proposition was partially confirmed. This result is in part surprising because general understanding in and outside of the military is that higher morale (dedication and vigour) will support performance (e.g., van Boxmeer et al., 2010; van Boxmeer et al., 2011; Bal & De Lange, 2015; Sekhar, Patwardhan & Vyas, 2017; Christian, Garza, & Slaughter, 2011, etc.). At the same time, higher cynicism and exhaustion have been found to be related to lower performance rates (Demerouti & Cropanzano, 2010). We might therefore conclude that military morale (positive side) does not support training performance, however burnout (negative side) influences it negatively. That is to say, performance in training rather supports military morale, also argued by van 't Wout & van Dyk (2015) and Lee (2017), and not vice versa.

Our third proposition offered relations between negative and positive affectivity and training performance which were partially confirmed by zero-order correlations and also by K-W dispersion analysis. Such relations were very small, however, and held only with some performance components.

Thus, our third proposition was also partially confirmed. More precisely, negative affectivity seems to have a negative impact on theoretical performance and positive affectivity a positive impact on physical and summarised performance. Generally, positive affectivity should contribute to success in training (Lyubomirsky et al., 2005), however we could find no strong evidence to support this except a weak effect on the physical test (an impact on the summarised performance is assumed to happen through physical performance). Taking into account that positive affectivity predicts physical activity (Pasco et al., 2011; Wang et al., 2012) and the test itself was conducted at the end of the basic course (i.e., not long after the beginning of conscription service), these findings rather reflect the influence of positive affectivity on physical training and as such started already before the service. On the other hand, negative affectivity was negatively related only to theoretical performance. Thus, the tendency to see training experience through a negative prism applied only to theoretical military knowledge. Drawing parallels from the academic performance literature (King et al., 2015), our results align with those.

Our fourth proposition forecasted relations between general self-esteem and training performance. The only performance indicator that did not show positive relations with self-esteem was practical performance. Therefore, we could conclude that this proposition was largely confirmed and generally supports the findings from the literature (Baumeister et al., 2003; Krauss & Orth, 2022; Spence, McGannon & Poon, 2005). This means that soldiers with reported high self-esteem most probably feel good and more positive about themselves, and therefore adapt more easily to stressful environments (Martínez-Martí, & Ruch, 2016), something that happens when young citizens enter into compulsory service. However, the reason why general self-esteem failed to be related to practical performance needs additional reasoning. We argue that the simplest explanation shows this result as a measurement error, thus being random (please also see the limitations section). However, an alternative explanation could be that general self-esteem reflects rather general psychological well-being and coping strategies, not predicting so well performance in a specific field (Dutton & Brown, 1997; Baumeister et al., 2003). In our case, practical military performance (digging trenches, using communication tools, shooting, etc.) could rather be significantly related to specific self-esteem which could reflect directly on the soldiers' self-evaluation of how capable and efficacious they are in the military field, and not so much on general self-esteem which reflects an individual's overall evaluation of the self. Additionally, self-esteem is a relatively stable trait and is supposed not

to change in the short term (Rosenberg et al., 1995), for instance, in the case of entering into military service or moving to a new physical location. This means that, although self-esteem is positively related to the various positive outcomes, there is little evidence to demonstrate the causal effect of self-esteem on those outcomes; occupational success may perhaps boost self-esteem and not the contrary (Baumeister et al., 2003).

The fifth proposition expected relations between training performance and perceived personal-organisation fit. The concept of person-organisation fit reflects the congruence of individual and organisational values (Werbel & DeMarie, 2005) and through that it will possibly support performance (Kristof-Brown et al., 2005). Results by zero-order correlations and dispersion analysis both confirmed that such a relationship exists as predicted, except (K-W) between practical performance and person-organisation fit. It is claimed that fitting oneself into organisations will emerge through fit-based attraction and the selection process because organisations might favour certain types of persons, and additionally emerge through the socialisation efforts which could improve and cement a previously established fit (Vleugels et al., 2022). Taking into account the context of conscription service in Estonia, we could assume that those selectees taking the 11-month service path (mostly voluntarily) have rather positive attitudes towards the service (Kasearu & Trumm, 2020) and therefore are more receptive to developing a congruence of individual and organisational values during training.

The sixth proposition presumed relations between self-regulatory focus and performance. Promotion regulatory focus was positively related with theoretical, physical and summarised performance indicators. At the same time, prevention regulatory focus was negatively related with physical and summarised performance. Therefore, our sixth proposition was partially confirmed. On the whole, this result is in line with some previous research which, for instance, has shown a positive relation between promotion focus and performance, and no (Gorman et al., 2012) or a negative relation (Świątkowski & Dompnier, 2020) between prevention focus and performance. Conscripts enter into service with different goals that they want to achieve. For instance, some of them could be considering a military or paramilitary career and therefore want to take the maximum from the training. On the other hand, some of them might simply want to pass the service without problems, meaning they just wish to cope. This explanation probably describes the best physical performance, meaning that some conscripts simply want to pass the test and some want to get the maximum score, leading to the different strategies for learning (Yasuda & Goegan, 2023) from conscription. Therefore, conscripts

could perceive different values on the subject of learning (components of the military training) which is, according to Eccles & Wigfield (2020), an important contributor to successful learning, reflected by the correlations with the soldiers' exam results.

Our seventh proposition which predicted positive relations between leadership self-efficacy and performance indicators was fully confirmed with both zero-order correlations and dispersion analysis. It was the only psychological variable to have positive relations with all performance indicators and therefore fully supports previous findings from the literature (Judge et al., 2007), this despite the fact that rather specific self-efficacy was included in our study (leadership self-efficacy). This result confirmed that beliefs about oneself in achieving certain results (Bandura, 1994: 72) in our study on the field of leadership are important contributors to the soldiers' test results.

We did not have specific propositions involving socio-demographic variables, however the results from the Kruskal-Wallis test revealed that place of residence and mother tongue did not have any significant effect on performance. However, age had a weak effect on physical performance, education had a weak effect on theoretical and summarised performance, and student status had a moderate effect on theoretical, practical and summarised performance. This result is somewhat controversial because higher education and the status of student could logically lead to better test scores. However, the relations were negative, which could be explained by motivational aspects. For example, conscripts having higher education or trying to get it (status of student) have already chosen their profession and perhaps see less value in conscription training compared with those soldiers who have not made such a choice.

Ordinal logistic regression was used with the aim of finding out the best set of psychological variables to predict different aspects of training performance. Firstly, theoretical performance was predicted, the results indicating that the strongest predictor was openness to experience, followed by general self-esteem, perceived personal-organisation fit and no student status from the positive side, and positive affectivity and education from the negative side. In other words, those conscripts who are high in openness, have higher general self-esteem, whose values are more in line with organisational values, do not have the status of student, have basic or secondary education, and experience fewer positive emotions (positive affectivity) will achieve better exam marks from tests measuring theoretical knowledge. One possible explanation would be that cognitive ability could form a roof concept to explain the results from the regression model. More precisely, cognitive ability is positively related to

openness to experience (Stanek & Ones, 2023) and it also could reflect some aspects of positive affectivity and general self-esteem (Naragon & Watson, 2009). A second possible concept to explain the results could be general well-being (Adler & Rehkopf, 2008). However, relations between positive affectivity, the status of student, level of education and theoretical performance were negative, which does not support either option. So, this might be a question that could be addressed in some future studies, especially taking into account: 1) that the upper critical interval of positive affectivity reaches exactly 1.00, which indicates no relation; 2) status of student and education could be explained by motivational factors (see above).

Secondly, those conscripts attaining higher scores on practical performance tended to be more open to experience, to have a higher perceived person-organisation fit, and to be less dedicated and more exhausted. Moreover, they also tended not to have the status of student. Generally, predictors such as openness to experience, person-organisation fit and the status of student were similar to predictors of the model forecasting theoretical performance. Nevertheless, several components were different, most interestingly low exhaustion and low dedication. The first one is logical; soldiers experiencing high exhaustion did not achieve high scores in practical performance (van Boxmeer et al., 2010; van Boxmeer et al., 2011; Bal & De Lange, 2015; Sekhar, Patwardhan & Vyas, 2017; Christian, Garza, & Slaughter, 2011). However, the second one is somewhat controversial. It could be explained by the unchallenging training during the basic course, which possibly leads to a lower level of dedication, with the ability to score in the practical exam remaining unchanged. This result is somewhat in line with the latest research findings, arguing that relations between dedication and exhaustion are not linear (Shimazu et al., 2018).

Thirdly, physical performance was predicted by affectivity (both), leadership self-efficacy, prevention regulatory focus, education and age. In the other words, conscripts achieving higher scores in the physical test tended to see the world from a positive prism (positive affectivity). At the same time, from a negative prism (negative affectivity), they also demonstrated higher leadership self-efficacy and lower prevention regulatory focus, and were less educated and higher in age. All results were logical and consistent with previous studies (for instance, Pasco et al., 2011), however higher negative affectivity as a predictor of the physical test requires additional comment. The only possible explanation which we could offer, in addition to the randomness of this result, is related to the situational aspects of affectivity. This means that negative affectivity will be impacted by situational factors that are especially common

at the beginning of the conscription service, e.g., a stressful environment, being away from home, training with an unfamiliar routine, low autonomy, etc. This, in turn, increases the situational assessment of negative affectivity (reflected in scores of PANAS test) in particular, as a result of which a (temporary) positive relation between the physical test results and negative affectivity may happen. Nevertheless, similar results were also demonstrated by Shockley et al. (2012) and Geiger, Lee & Geiger (2019).

Taking into account the results from all analyses, we conclude that the best psychological variable for predicting training performance (especially theoretical) is openness to experience. It is also interesting to note that openness to experience was the only personality trait which contributed significantly to performance. Thus, individuals who are more open to fantasy, aesthetics, feelings, actions, ideas and values (McCrae & Costa, 2008) tend to perform better in military training. At the same time, conscientiousness and emotional stability, traditionally seen as the most important personality traits for performance (He, Donnellan & Mendoza, 2019), did not show any more significant contribution to prediction of performance than other psychological constructs (military morale, affectivity, general self-esteem, etc.) which were included in the models. Unfortunately, we could not analyse the predictive value of cognitive ability on training performance, thereby eliminating its possible impact on the results. One possible change could have been that, due to the positive correlation between constructs (Stanek & Ones, 2023), the predictive power of openness to experience on the soldiers' basic course exam results would have decreased.

Additionally, leadership self-efficacy makes a difference between performance groups, however only in the case where personality does not contribute to the model. Thus, we deduced in line with findings from Judge et al. (2007) that even specific self-efficacy does not have incremental validity over personality traits (in our case, openness to experience) for predicting training performance. At the same time, person-organisation fit has incremental validity over the personality, affectivity and military morale for predicting soldiers' basic course theoretical and practical exam results.

Developing these arguments further and taking into account the fact (https://kra.ee/ajateenistus/ajateenistusest/) that a remarkable proportion of 11-month conscripts will continue their conscription service as military leaders (non-commissioned officers or officers), the decision of who goes on to the leaders' course will however be developed, among others, on the results from the soldiers' basic training course. To put our results in another light, we could propose that the scores from the soldiers' basic course do not

necessarily anticipate successful further service as a leader because course results are rather predicted by variables which are not directly related to successful leadership (for instance Matthews et al., 2006). This conclusion could help conduct a better selection of candidates for leadership positions.

Bringing military morale as work engagement and burnout into the discussion, we argue that its role in describing training performance is rather limited. Only exhaustion and dedication demonstrated a significant role in predicting practical performance, although some previous studies outside of the military have proposed that work engagement and burnout play a critical role in facilitating how personality influences individuals' work behaviour (Swider & Zimmerman, 2010; Inceoglu & Warr, 2011). Looking generally at the results, we argue that taking out the negative side of morale (conceptualised as burnout) could enhance more test results than supporting the positive side of military morale (conceptualised as work engagement). In conclusion, if personality and positive and negative affectivity is added to the prediction models, military morale (work engagement and burnout) seems to not play a significant role in predicting training performance.

Despite the lack of strong guidance on how to interpret pseudo R^2 values (Osborne, 2015; Pituch & Stevens, 2016; Smith & McKenna, 2013; Lomax & Hahs-Vaughn, 2012), one conclusion is that psychological variables, together with socio-demographic ones, are best at predicting theoretical performance and worst at predicting practical performance. So, considering the question of how well training performance would be predicted by psychological and socio-demographic variables, we argue that theoretical and physical performance are predicted to some extent, however practical performance is not predicted so well. For instance, while all regression models included some background variables, their effect on performance was rather weak. Some might ask what would happen to the results if we included cognitive ability as a predictor of performance into the study. Perhaps openness to experience and general self-esteem would lose their predictive power (Stanek & Ones; Naragon & Watson, 2009), although the question could be related to the motivational aspects. Education and the status of student were negatively related to performance, indicating that some intelligent conscripts might not perform better despite possibly having higher cognitive ability.

Limitations of the study

We have identified some limitations which should be taken into account when interpreting the results of the study. Firstly, the majority of the instruments

used to measure psychological constructs are well-reported measures in the literature. However, at the time of our study, they were not widely used in an Estonian context so it would be interesting to see whether the results would be comparable if other measures were used or if the study could be repeated.

Secondly, psychological and socio-demographic variables explained a certain amount of the variance of performance (7–10% McFadden; 12–24% Cox & Snell; 15–25% Nagelkerke), therefore the rest of the performance variance was described by something else. For instance, including cognitive ability into the study variables—which has been found to be one of the strongest predictors of performance in and outside of the military domain (for example, Schmitt, 2014; Mackey & DeOrteniis, 2018)—could significantly increase the descriptive power of the prediction. Unfortunately, data on cognitive ability was not available to the authors.

Thirdly, the measures of performance (except physical performance) were not the best to use in statistical calculations and this circumstance may have slightly affected the results, reducing the variance of one performance group or another.

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