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Moderated Mediation in the Relationship Between Self-Efficacy and the Effectiveness of Military Training for Reservists

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Abstract

This study focuses on the evaluation of the moderating role of psychological resilience in intrinsic motivation. These causal relationships were evaluated in terms of self-efficacy and perceived military competence, taking into account the effects of intrinsic motivation and psychological resilience. Five hypotheses were developed on the effects of the theoretically supported variable relations. The study data set was collected from the Active Lithuanian Army Reserve. In this study, 354 soldiers were investigated using the Brief Resilience Scale (BRE), the Self-Efficacy Scale (EFF), the Intrinsic Motivation Scale (INM) and the Perceived Military Competence Scale (PMC). The results of the analysis conducted showed that between self-efficacy and the growth of perceived military competence is a positive relationship both for soldiers with high and low points of intrinsic motivation. In addition, it can be concluded that reservists with higher internal motivation have more confidence in their abilities to act and achieve the set goals, which can have a significant impact on reservists' readiness to improve their military competence. Similarly, self-efficacy appears to be vital in improving military competences among soldiers with less intrinsic motivation. Moreover, soldiers with higher intrinsic motivation and higher psychological resilience probably increase their military competence due to the pleasure they derive from participating in military exercises.

KEY WORDS: *military training, sustainable soldiers' competences, psychological resilience, moderation, mediation*

1. Introduction

Military training, due to its specificity, places a primarily physical and psychological pressure on the soldiers [1]. Therefore, these specific trainings can create conflicting thoughts for reservists who are only briefly taken from their main activities in civilian life. Consequently, reservists may not complete training for a variety of reasons, including lack of medical fitness, injury or illness, or due to poor psychological suitability for military service [2].

The selection system typically screens potential candidates to determine their suitability for military service. This case is true for a newcomer to the military. As a newcomer, all candidates are tested both for psychological fitness and medical fitness before training [3]. Those persons who are found to be at risk of severe exhaustion or other problems related to the performance of military tasks no longer participate in training; they are exempted from military service. The psychological suitability of the applicants is primarily assessed using paper-and-pencil tests. "Such tests focus on a measure of general intelligence, which has been shown to correlate significantly and positively with various measures of educational success, including completion of military training. Factors such as coping skills, defense mechanisms, and motivational attributes are also important"[4] and can be similarly tested. Routine medical screening is dysfunctional in both military situations and civilian sports. Therefore, a potential reservist answers a series of questions about past or present injuries or illnesses, and in some cases, potential candidates are tested or monitored to rule out major illnesses or structural deficiencies.

However, after the selection process is conducted and the evaluation and selection of suitable candidates for the military service is completed, only little information is collected about their readiness and functional abilities. To add, no testing is applied to test the ability of individuals to work and withstand adequate physical load under physical and psychological stress [5-8]. However, this significant information is important because many of reservists before and after attending military training have civilian jobs, which usually are less physically and psychologically demanding as military training. Previously conducted studies in civilian and military populations

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have shown that in occupations that require to complete the physically demanding tasks people must have a range of functional strengths and good physical fitness, and these capabilities are critical predictors of success in performing the high demanding tasks.

The main purpose of this research was to clarify how the performance of reserve soldiers can influence the impact of military training on the competencies of reservists when the moderation of psychological resilience is mediated by intrinsic motivation. The intention of reserve soldiers to perform military training successfully is not widely studied in scientific works. This research emphasizes the importance of psychological resilience, intrinsic motivation, and self-efficacy to expand the intention of people to serve in the Lithuanian army and present the specifics of the motivation of soldiers to demonstrate greater achievement of objectives and greater participation in the defense of the country.

2. Theory and Hypotheses

Scholars typically represent self-efficacy as beliefs about one's ability to act in such a way that it will be possible to achieve positive goals [9,10]. In addition, it can be argued that people's beliefs about self-efficacy influence their choices and may increase their ability to make decisions about difficult goals or challenges they face. Belief patterns are believed to be autonomous or hindering, their struggle, the amount of stress experienced, and vulnerability to depression [9,10]. Psychological studies highlight a positive connection between self-efficacy and performance [11,12]. Moreover, Self Determination Theory (SDT) advocates that the need for capability (which has some similarity to self-efficacy) can be somehow forced by the intrinsic motivation of individuals. With this research we investigated whether such an association exits. It is conceivable that self-efficacy stimulates intrinsic motivation in the meantime and is a fundamental component in the improvement of intrinsic motivation. Also, it is known that self-efficacy and intrinsic motivation are theoretically dissimilar components. Someone can be unlucky in both their effectiveness and intrinsic motivation, excel in both, excel in one, and fail in the other. These understandings help us develop a few hypotheses testing whether the level of intrinsic motivation can somehow increase or decrease the relationship between self-efficacy and military competence obtained during the training. Furthermore, the study included the moderated effect of resilience. The hypothesized model is presented in Fig.1.

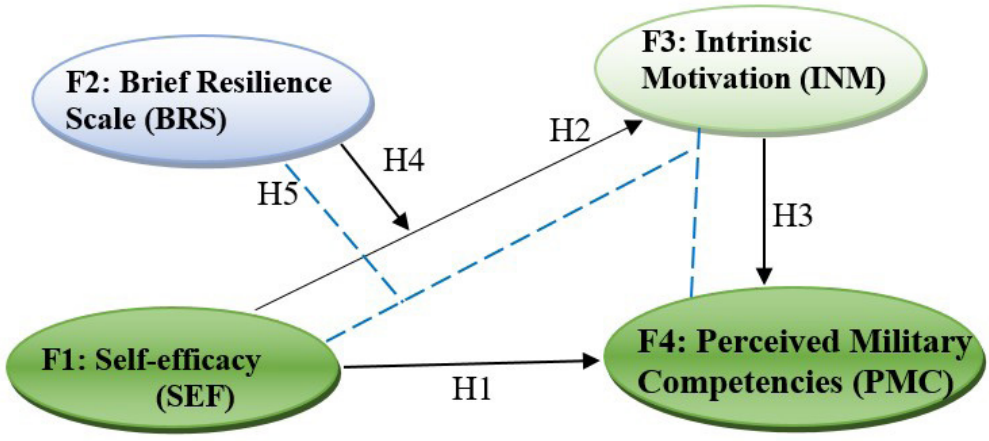

Fig. 1. Hypothesized theoretical model: H1 and H2 represent the main effect of self-efficacy (SEF); H3 indicates the mediation of intrinsic motivation (INM); H4 represents the moderating effects; H5 – the moderated mediation effect of psychological resilience (BRS) on perceived military competencies (PMC) through intrinsic motivation (INM).

In our hypothesized theoretical model, intrinsic motivation was included as an enlargement component. We propose that intrinsic motivation for military training moderates the association between self-efficacy and perceived military competencies, as soldiers who have high (vs. low) intrinsic motivation will be motivated to perform because of their self-efficacy. Intrinsically driven soldiers can be more self-driven and that they will be more motivated to take the obligation of obtaining the necessary military skills and competencies when they believe in their ability. Research in organizational settings proposes that employees with high intrinsic motivation show greater achievement of goals and become more involved in their professions [13]. Consequently, the relationship between self-efficacy and perceptions of obtained military competence should be higher when the level of intrinsic motivation is higher

than when it is lower. Intrinsic motivation for military studies, as a reinforcement of self-efficacy, may not be equally important for all soldiers in enhancing their military competence. Dysvik et al. [14] reported that favorable training programs compensate, at least to some extent, for lower intrinsic motivation related to impact on results. Lastly, if soldiers have low psychological resilience and low internal motivation, they may feel pressured to perform well at military training [15]. These insights led to the development of the model, and the relationships between the constructs of the hypothesized theoretical model were evaluated according to the following hypotheses:

1. For assessment and description of main effects:

H1: Self-efficacy (EFF) has a positive effect on perceived military competencies (PMC). As such, reserve soldiers with higher levels of self-efficacy tend to show higher military competencies).

H2: Self-efficacy (EFF) has a positive effect on intrinsic motivation (INM), such that reserve soldiers with higher levels of self-efficacy tend to have higher levels of intrinsic motivation compared to those with lower levels of self-efficacy.

2.Hypothesis development for the evaluation of mediation and moderation effects:

2.1 Mediation of intrinsic motivation:

H3: Intrinsic motivation (INM) positively mediates the relationship between self-efficacy (EFF) and perceived military competencies (PMC), so that reserve soldiers with higher levels of intrinsic motivation tend to have higher levels of perceived military competencies compared to those with lower levels of intrinsic motivation.

2.2. Moderation by psychological resilience (BRE):

H4: Psychological resilience (BRE) positively moderates the relationship between intrinsic motivation and perceived military competencies (PMC), so that the positive effect of psychological resilience on perceived military competencies is enhanced for reserve soldiers with high intrinsic motivation and reduced for reservists with low intrinsic motivation.

2.3. Therefore, we suggest that higher psychological resilience may increase the indirect effect of self-efficacy on perceived military competencies through intrinsic motivation, while low psychological resilience may reduce the indirect effect. Therefore, we recommend the moderated mediation hypothesis:

H5: Psychological resilience (BRE) positively reduces the strength of the mediated connection between self-efficacy and perceived military competencies through intrinsic motivation, so that the mediated relationship is stronger under high psychological resilience than under low psychological resilience.

3. Methodology of Conducted Analysis

3.1. Study Participants and Data Collection Procedure

In this study, the reserve soldiers from the Active Lithuanian Army Reserve (ALAR) were investigated. A total of 375 questionnaires were distributed and 354 valid questionnaires were obtained, with a recovery rate of 94.4%. All solders were men (100%). The age of the reserve soldiers was in an interval of 21 to 46 years. More than half of the ALAR soldiers represented private organizations (70%). The education of the respondents ranged from basic to university. The university and higher education had more than 30% of the reservists. The ALAR soldiers came from different organizations where they had different positions. The main part (70%) of the respondents in this study were specialists.

3.2. Research Context

The designed study generally focused on four measurement constructs, such as the self-efficacy scale (coded in the model as EFF), brief resilience scale (coded in the model as BRE), intrinsic motivation scale (coded in the model as INM), and the perceived military competence scale (coded in the model as PMC). Likert's five-point scale was used to measure the statements, when 1 indicated 'complete disagreement' and 5 indicated 'complete agreement'.

Self-efficacy scale. Self-efficacy in a military context was assessed on a validated scale [16]. The study questionnaire includes sample items such as 'will manage to complete military training', 'will achieve a result I can be proud of'. These items helped to evaluate self-efficacy beliefs about the ability to carry out military training productively. The internal consistency agreeing to Cronbach's alpha was 0.884, comparatively large, and exceeded the requirements [17] for exploratory measures (above 0.70).

Intrinsic motivation scale. To measure intrinsic motivation, nine statements of internal motivation (see Deci, Ryan's self-determination theory), some statements were modified following Grant [18], including the example 'I like military service,' 'I think it is fun to serve in the military,' 'The military profession inspires me,' and concerning earlier military studies. The internal consistency was evaluated using the Cronbach alpha of 0.932.

Perceived military competence scale. For the measurement of perceived military competence scale covering domains such as: responsibility, judgment, cooperation/communication, creativity, coping, and perspective.

The sample items include 'I acquired new and consolidated the skills I already had', 'I learned teamwork skills', 'After completing this training, I can be proud of myself' and others. The responses were recorded on a 5-point scale (below average, slightly below average, average, slightly above average, and above average). The internal consistency measured by Cronbach's alpha was 0.907.

The Brief Resilient Coping Scale. It was used to measure the psychological resilience of the soldiers. It is a four-item instrument designed to capture a person's ability to cope with stressors by adapting to more difficult than usual conditions. This scale is evaluated in other studies as a reliable tool, translated into many languages, adapted to very different samples during the pilot study. This study used the Lithuanian version of the questionnaire. The internal consistency of this scale was evaluated by Cronbach's alpha coefficient which was 0.773.

3.3. Data Processing

First, a frequency calculation analysis was performed and the demographic characteristics of the data sample were evaluated. Then the correlation analysis was performed and the relationship between the measurement variables before confirmation of the hypothesis was assessed. In addition, a confirmation factor analysis was used to evaluate the validity and reliability analysis of the measurement construct using the Cronbach alpha coefficient. Lastly, five hypotheses were confirmed by applying SPSS PROCESS v3.5 macro-models 4 and 7 developed by Hayes (2017) to complete the research objectives. In this study, IBM SPSS 28v is used to analyze the reliability and validity of the constructs of this study. In addition, the degree of adjustment of the entire model was estimated using AMOS 28v.

4. Modelling Results

4.1. Preliminary Analysis Results

First, confirmatory factor analysis (CFA) was used to evaluate the theorized model with four factors that represent the causal relationships between self-efficacy (EFF), intrinsic motivation (INM), psychological resilience (BRE), and perceived military competence (PMC). The results of the CFA modelling indicated a good fit with the data ($\chi^2/1 = 1.751$, $p = 0.186$; RMSEA = 0.046; CFI = 0.998; TLI = 0.975) according to the suggestions of the scholars [16,17]. Additionally, we evaluated the discriminant and convergent validity of these study elements using exploratory factor analysis (EFA). The EFA results showed that all study items were loaded on the appropriate factor with factor loadings ranging from self-efficacy (EFF) from 0.704 to 0.865; psychological resilience (BRE) from 0.701 to 0.802; intrinsic motivation (INM) from 0.720 to 0.891; perceived military competence (PRC) from 0.665 to 0.872. This analysis made it possible to establish that the correlation coefficients between the observed values of the included factors exceed the value of 0.30 [19]. Consequently, discriminant and convergent validity was maintained. Regarding reliability estimates, the Cronbach alpha coefficient ranged from 0.773 to 0.932, providing evidence of a reliable measurement model. The preliminary analysis results are presented by constructs means, stand. deviations, consistency estimates, and relationship values as bivariate correlations in Table 1.

Table 1.

The preliminary study analyses.

Factor	*Descriptive*		*Discriminant validity*					
	M	**SD**	**CR**	**AVE**	**C1**	**C2**	**C3**	**C4**
C1: Self-efficacy	4.41	0.65	0.920	0.650	**0.806**			
C2: Psychological resilience	3.59	0.75	0.856	0.599	0.401**	**0.773**		
C3: Intrinsic motivation	3.51	0.84	0.943	0.649	0.587**	0.432**	**0.806**	
C4: Perceived military competence	3.87	0.80	0.925	0.612	0.381**	0.139*	0.407**	**0.782**

Notes: C1 = self-efficacy (EFF); C2 = psychological resilience (BRE); C3 = intrinsic motivation (INM); C4 = perceived military competence (PMC). CR= construct reliability; AVE= average variance extracted. **Pearson's correlation is significant at the 0.01 or * 0.05 level (2-tailed). M = means; ±SD = standard deviations.

The relationship data analysis showed that intrinsic motivation was statistically significant associated with self-efficacy (INM and EFF, $r=0.587$, $p<0.01$), psychological resilience (INM and BRE, $r=0.432$, $p<0.01$), and perceived military competence (INM and PMC, $r=0.407$, $p<0.01$). Perceived military competence was highly statistically significant associated with self-efficacy (PMC and EFF, $r=0.381$, $p<0.01$). Finally, perceived military competence showed a low but statistically significant relationship with psychological resilience (PMC and BRE, $r=0.139$, $p<0.05$).

Convergence validity analysis lets us indicate the measures for study construct reliability (CR). The results of the CR calculation ranged from 0.856 to 0.943 (see Table 1). Furthermore, the extracted mean variance (AVE) was greater than 0.50, and ranged from 0.599 to 0.650 (see Table 1). Moreover, the calculated square root of AVE measures for each construct let us identify that the correlation coefficients among the constructs were smaller than the calculated square root measures of the constructs AVE (see numbers on the diagonal, Table 1). Thus, let us confirm the discriminant validity of our study constructs [20].

4.2. The Hierarchical Moderated Regression Analysis Results

The PROCESS v3.5 macro- Model 7 was used to assess and confirm whether psychological resilience moderates the mediating effect of intrinsic motivation in the relationship between self-efficacy (EFF) and perceived military competences (PMC). Additionally, to confirm the statistical significance of indicated effects, the bootstrapping of 5000 was used with the 95% confidence interval. First, after entering self-efficacy (EFF) as an independent variable and perceived military competencies (PMC) as a dependent variable, hypothesis H1 showed that reservists self-efficacy positively affects perceived military competencies (EFF→ PMC, $\beta = 0.299$, $p < 0.001$). Second, as a result of the analysis of the impact of reserve soldier self-efficacy on intrinsic motivation (INM), hypothesis H2 demonstrated that the self-efficacy of reservists was highly associated with a significant impact on intrinsic motivation (INM) (EFF→ INM, $\beta = 0.638$, $p < 0.001$), providing to the acceptance of hypothesis H2.

Third, Hypothesis H3 was established to assess the impact of intrinsic motivation (INM) on perceived military competences (PMC) and established that intrinsic motivation has a positive effect on perceived military competences ($\beta= 0.272$, $p < 0.001$). Fourth, the interaction between the self-efficacy of reserve soldiers and psychological resilience was significant ($\beta = 0.072$, $p < 0.05$), and hypothesis H4 was accepted, which verified the moderating effect ($R2 = 0.051$, $p < 0.05$) was accepted (Table 2).

Table 2.

Regression results for the a-part from EFF to INM and for the b-path from INM to PMC

Variable	Model 1 for a-path (INM)			Model 2 for b/c'-path (PMC)		
	β	**SE**	**p**	β	**SE**	**p**
EFF	0.638	0.076	<0.001	0.299	0.079	<0.001
BRE	0.317	0.066	<0.001			
Interaction:						
EFFBRS	0.072	0.065	<0.05			
INM					0.272	<0.001
Model 1 summary for a-path (INM)						
	R^2	**F**	**MSE**	**df1**	**df2**	**p**
	0.356	59.994	0.453	3	352	<0.001
Model 2 summary for b/c'-path (PMC)						
	R^2	**F**	**MSE**	**df1**	**df2**	**p**
	0.201	41.064	0.518	2	351	<0.001
ΔR^2	0.155**					

Note: **—statistical significance < 0.001.

Furthermore, the self-efficacy of the reservists verified the mediating effect of intrinsic motivation in the relationship with perceived military competences. The total effect of the pathway between the self-efficacy of reserve soldiers and perceived military competence was significant ($\beta= 0.509$, $p < 0.001$), and the direct effect was positive and significant ($\beta= 0.299$, $p < 0.001$). Verification of the indirect effect of intrinsic motivation as a mediator using the bootstrapping test indicated that the indirect effect can be confirmed because there is no zero between the upper and lower limits of the bootstrap interval values. Hypothesis H3 was accepted, the reserve soldiers with higher levels of intrinsic motivation are linked to have higher levels of perceived military competence compared to those with lower levels of intrinsic motivation.

The analysis carried out allowed us to evaluate the conditional values of the indirect effect of psychological resilience (BRE). The moderated effect of psychological resilience on intrinsic motivation evaluation showed a

statistically significant interaction between self-efficacy and perceived military competencies. The conditional procedure estimates the path effects in the form of a confidence interval are presented in Table 3.

Table 3.

Conditional indirect effects through intrinsic motivation (INM).

Mediator (INM) **EFF → INM →PMC**	**Moderator (BRE)** **value [+*SD*]**	**Effect**	**BootSE**	**Boot LLCI**	**BootULCI**
Intrinsic motivation (INM)	-0.640(M-1SD)	0.161	0.048	0.077	0.266
Intrinsic motivation (INM)	0.000(M)	0.174	0.052	0.085	0.286
Intrinsic motivation (INM)	0.640(M+1SD)	0.186	0.060	0.087	0.321

Notes: INM= intrinsic motivation; BRE= psychological resilience. M= mean, SD=standard deviation; BootSE= standard error, BootLLCI, BootULCI= bias-corrected 95% confidence interval (lower limit, upper limit).

The conditional effect of the self-efficacy of reserve soldiers according to psychological resilience was significant in the psychological resilience values of M-1SD (-0.640) to M+1SD (0.640) and in M (0.000). If psychological resilience was high, the effect of intrinsic motivation on perceived military competencies was high and significant (see Table 3). The moderating role of psychological resilience on perceived military competencies in the relationship between self-efficacy and increased intrinsic motivation is presented graphically (see Fig.2).

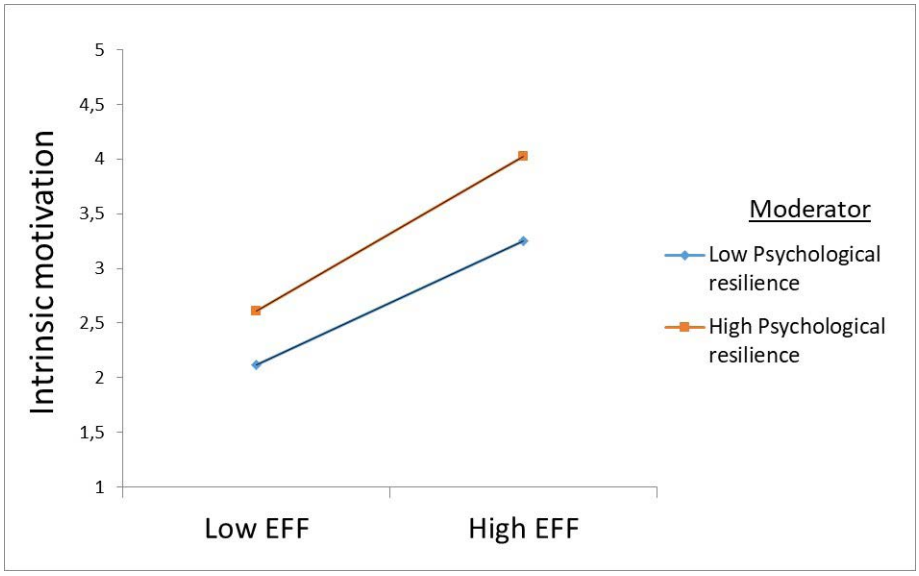

Fig. 2. The moderating role of psychological resilience for perceived military competencies on the relationship between self-efficacy and increased intrinsic motivation.

Finally, the results show that hypothesis H5 can be accepted. Psychological resilience (BRE) positively moderates the strength of the mediated relationship between self-efficacy and perceived military competencies through intrinsic motivation, so that the mediated relationship is stronger under high psychological resilience than under low psychological resilience.

4. Conclusions

This study confirmed the impact of the self-efficacy of reserve soldiers on perceived changes in military competencies during training in the Active Army Personnel Reserve of Lithuanian Armed Forces. In addition, this study confirmed the mediating role of intrinsic motivation in the relationship between reservists' self-efficacy and perceived military competencies. The conducted analysis helped clarify the psychological behavior mechanism of soldiers in military training by authenticating the moderated mediating effect of psychological resilience in the relationship between self-efficacy of soldiers, intrinsic motivation, and perceived military competencies. The results of the modelling analysis let us confirm the hypotheses set through causal correlations among four variables using regression analysis and the PROCESS v3.5 macro developed by Hayes.

Psychological resilience played a moderating role in the relationship between reservist self-efficacy and intrinsic motivation. Furthermore, the study showed that psychological resilience had a conditional effect on the influence of self-efficacy of soldiers on perceived military competencies through intrinsic motivation. In addition, intrinsic motivation fully determined the self-efficacy of reservists and perceived military competencies.

Consistent with the Self Determination Theory (SDT) literature, these findings contribute to self-efficacy research by explaining the interactive effects of intrinsic motivation arising from self-efficacy beliefs and motivation arising from task characteristics on overall military competence. Furthermore, this study opens up a new approach to find ways to develop the internal motivation of reservists and improve the results of their military training.

Data Availability Statement

Not applicable.

Ethics Statement

Institutional Review Board Statement: The study was approved by the Gen. Jonas Zemaitis Military academy, Protocol No. PR-1815. Informed consent was obtained from all subjects involved in the study.

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