Juridisko un Sociālo Zinātņu

# BALTIJAS ŽURNĀLS

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Juridisko un Sociālo Zinātņu  **BALTIJAS ŽURNĀLS**

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# Contents

# OPENING REMARKS TO THE READERS OF THE SPECIAL ISSUE "BALTIC JOURNAL OF LEGAL AND SOCIAL SCIENCES"

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Dear Readers!

It is a great pleasure to introduce a new issue of our scientific journal to you. This issue is intended to expand the role of psychology in the modern life of everyone who undertakes to read it. The goal of this issue is to acquaint readers with research that reflects current issues of Social Psychology, Personality Psychology, and modern Philosophy of Mind.

The authors of the articles are students of the Professional Master Programme "Psychology", lecturers and researchers of the Study Field "Psychology" of the Baltic International Academy, as well as Oxford Uehiro Centre for Practical Ethics, University of Oxford (UK) and Department of Civil Law Disciplines, V. N. Karazin Kharkiv National University (Ukraine).

This issue contains both empirical studies and studies that are theoretical in nature and represent the problems at the nexus of Psychology, Philosophy and Law Science.

The article by Associate Professor, Doctor of Psychology Ishgaley Ishmuhametov is devoted to empirical research of loneliness in old age: a study of elderly people in Latvia. The research involved

older people living in various social settings: alone, with relatives or in nursing homes. The research results presented by the author showed that people who feel the need for close relationships are most prone to loneliness. This highlights the importance of developing social bondings and support for older people, especially those living in social service institutions. The results show the possibility that both men and women are equally affected by loneliness, and that people with higher levels of education may experience less loneliness. This information can be useful in developing programs and support mechanisms for older people who are struggling with loneliness.

The following three articles were written by students during their bachelor studies in the Psychology Programme.

The article by master's student Marija Stepanjko, is devoted to empirical research of emotional intelligence and psychological well-being. Emotional intelligence allows people to have a more positive outlook on the world, higher self-esteem and greater resilience, which is essential for psychological well-being. The research results support the idea that emotional intelligence and psychological well-being are interrelated. High emotional intelligence and high psychological well-being go hand in hand. As well as low emotional intelligence and low psychological well-being correspond to each other. The author draws attention to the fact that emotional intelligence is a flexible construct that can be developed in order to strengthen one's ability to understand and regulate emotions, both one's own and those of others, which will help in communication and increase the level of psychological well-being.

The article by master's student Aleksandra Teterina is devoted to empirical research of the relationship between self-esteem and achievement motivation among students. Self-esteem is considered from two points of view: as a stable personal trait (global self-esteem) or as a state self-esteem. The state self-esteem can also be domain-specific, e.g. social self-esteem, performance self-esteem and appearance self-esteem. Achievement motivation is seen as the desire "to work well and be successful, as well as the desire to overcome difficulties and cope with obstacles that arise along the way". Positive relationships with the large effect sizes between achievement motivation and state self-esteem, performance-oriented self-esteem, social self-esteem, and global self-esteem were revealed. A moderate positive relationship between achievement motivation and appearance-oriented self-esteem was found. The high achievement motivation and high self-esteem correspond with each other. The low achievement motivation and low self-esteem correspond with each other. The author of the article hopes that information about the relationships found will enable educators and psychologists to develop targeted methods and strategies to support students' self-esteem and motivation.

The article by master's student Jevgeni Nietosniitty is devoted to research of the relationship of the academic achievement motivation with self-esteem and anxiety of students. Being successful at college or university studies has a big impact on students' life. For this reason, it is important to understand the factors, which relate to study motivation. Previous research suggests, that two such factors may be self-esteem and anxiety. However, there is lacking amount of research on the topic. Especially the effect of specific aspects of self-esteem and anxiety on various aspects of academic achievement motivation remains scarcely studied. In this study the relationship between various aspects of self-esteem, anxiety and academic achievement motivation is assessed and results are analysed. The relationship between self-esteem and achievement motivation as well as between anxiety and achievement motivation and their various aspects was found.

The article by Doctor of Philosophy Vsevolods Kachans is dedicated to the method of scientific modelling and the limits of its application in the research of the mind. Firstly, to the problem of the epistemic essence and typology of models in science; secondly, to the problems of determining the scope and boundaries of the application of the modelling method in studies of the human psyche. The main part of the article is devoted to the consideration of various concepts of modelling the functions of consciousness. In this context, the article analyses behaviourism, the models of which do not meet

the requirements of the completeness principle. In addition, a special place in the article is given to the idea of computer modelling of consciousness and its justification within the framework of the functionalist approach as the most recognised in modern psychology. The spread of functionalism is associated with the successful use of the concept of machine modelling of rational functions proposed by A. Turing and his followers. At the same time, the author of the article dwells on a critical analysis of functionalism from the standpoint of J. Searle's emergent naturalism and D. Chalmers' epiphenomenalism. In this context, it is shown that the creation of effective computer programs is not a sufficient basis for the universalisation of the functionalist approach in the study of the psyche and consciousness. Thus, the application of this approach in the study of the psyche must be accompanied by an understanding and consideration of its scope and boundaries.

The article by Ph.D. in Law, Associate Professor, Viktor Savchenko, Research Fellow, Oxford Uehiro Centre for Practical Ethics, University of Oxford (UK) and Associate Professor at the Department of Civil Law Disciplines at V. N. Karazin Kharkiv National University, is devoted to three psychological constants of free will: 1) the existence of a choice of actions, 2) independent decision-making, and 3) the variability of existing options. The issue of free will is the subject of scientific research in psychology, philosophy and jurisprudence. The psychological understanding of free will has its specificity and is based on three constants. The author defines that the cancellation of one of the given constants will lead to the levelling of freedom of will. The article examines how limiting the options for choosing actions occurs by creating a dilemma, a false dilemma, or when we apply "Hobson's choice" or the catch-22 technique. The author emphasises that there are other ways of influencing free will, but they are united by a single goal – to create circumstances when the choice of actions will be limited. A person always has the freedom to choose actions. Exceptions are only cases of unconsciousness and not being aware of one's actions. The author substantiates the thesis that the basis of social relations is the concept of the existence of free will. The ability to oppose one's free will to external influence is associated with willpower and self-control.

Based on the Baltic International Academy, all studies of explicit and implicit assessments of hardiness and its components were carried out for research participants whose professions are associated with risk: for professions associated with unconditional execution of orders, for security guards, for long-distance truck drivers, and for professional soccer players. The research was carried out under the guidance of Doctor of Psychology, Professor of Psychology Irina Plotka. The research involved: Nina Blumenau, Doctor of Engineering Sciences, Associate Professor of Psychology and  Dmitry Igonin - Doctor of Psychology, Head of the Scientific Agency Latenta LTD, Member of the Board of the Latvian Association of Professional Psychologists (EFPA Member). Undergraduates also contributed to the study of implicit attitudes to hardiness using the IAT and explicit attitudes towards hardiness: Tatjana Gajevskaja (hospital guards), Evgeny Kunavin (soccer players), Daiga Kruzite (long-distance truck drivers) and Jeļena Šaplavska who defended her doctoral dissertation (on professions related to risk) in 2014. In this issue of the journal, we present the work of Prof. Irina Plotka and Associate Professor Nina Blumenau linking all four studies.

We hope that the research presented in this issue will be of interest to readers.

We expect for a friendly and business-like perception of the journal by readers who can potentially be not only its readers, but also the authors of its publications.

We would like to thank all the authors who contributed to this issue!

# LONELINESS IN OLD AGE: A STUDY OF ELDERLY PEOPLE IN LATVIA

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**Abstract.** The article discusses the peculiarities of loneliness among elderly people in Latvia. The study involved 98 people aged 65 to 86 living in different social conditions: alone, with relatives, or in a retirement home (Latvia). Psychometric characteristics of the UCLA Loneliness Scale (Version 3), adapted by the author, are presented. The survey results show the views of the elderly on old age and loneliness, feelings arising from loneliness, relationships with others, peers, and communication skills. The reasons for loneliness and the peculiarities of behavior during loneliness were studied. The experience of loneliness is also analyzed depending on social conditions.

**Key words:** loneliness, elderly age, loneliness measurement, UCLA Loneliness Scale (Version 3), social conditions.

**Introduction.** Loneliness in old age is a growing problem, particularly in light of the increasing number of elderly people worldwide. According to the World Health Organization, by 2030 every sixth person in the world will be 60 years old or older, and by 2050 the global population aged 60 and above will double (World Health Organization, 2022). In Latvia, for example, as of the beginning of 2021, every fifth resident was a person aged 65 or older (Centrālā statistikas pārvalde, 2021). As older people live longer, they are at greater risk of loneliness, social isolation, and related health consequences. This means that loneliness in old age is becoming an increasingly pressing issue that requires attention from society and science.

Elderly people often face many problems, including chronic illnesses, disability, and social isolation, which can contribute to the development of loneliness. This is a public problem that can have a negative impact on physical and mental health, lead to depression, impair cognitive abilities, and increase mortality.

Moreover, the COVID-19 pandemic has exacerbated the problem of loneliness among elderly people. Due to social distancing and quarantine measures, many elderly people have been forced to isolate themselves from their families, friends, and social networks, which has led to an increase in feelings of loneliness and social isolation (Berg-Weger, Morley, 2020).

Given the negative impact of loneliness on the health and well-being of elderly people, it is important to understand the causes and risk factors associated with this phenomenon. The aim of this researchis to investigate the problem of loneliness among elderly people, identify the frequency of its occurrence, and determine the factors that may contribute to its development. To do this, the following questions will be addressed:

RQ1: How often do elderly people feel lonely?

RQ2: What factors contribute to the development of loneliness in old age?

RQ3: What proportion of elderly people in our sample experience loneliness, and how does this proportion vary across groups (by gender, age, social status, education level, etc.)?

**Literature review.** Loneliness in old age is not a straightforward concept with a single social meaning. It is not only the absence of relatives, children, grandchildren, spouses, or living separately from younger family members. For many elderly people who live with their families, the feeling of loneliness is no less severe. Family does not always solve the problems of loneliness for older people.

Loneliness is a complex feeling that takes hold of a person's entire personality – their feelings, thoughts, and actions. Loneliness manifests as an extremely unpleasant and burdensome experience, a reaction to a deficiency in the quality and quantity of social interaction. It arises from a lack of social connections, a lack of unity with others, a constant self-perception as different from those around, an awareness of unsatisfactory quality of interpersonal relationships with significant people, and the reference group (Išmuhametovs, 2007).

According to C. Victor and K. Yang (2012) loneliness follows a U-shaped distribution, with the highest levels observed among individuals under 25 years and those over 65 years of age. K. Toivonen et al. (2021) report that feelings of loneliness and social isolation are present at different stages of life, with 50% of individuals over the age of 60 being at risk of social isolation and one-third experiencing some degree of loneliness in later life.

Several studies have shown that higher levels of loneliness are correlated with depression, lower quality of life, and lower social support, particularly in the emotional realm (Theeke, Goins, Moore & Campbell, 2012). It is important to note that depression is associated with loneliness across all age groups. Poor physical health is associated with loneliness in young and middle age, but not in old age (Victor & Yang, 2012).

Longitudinal studies on loneliness among older people have shown that after 8 years from the initial survey, the prevalence of loneliness remained at a similar level: 9% reported severe loneliness; 30% reported occasional loneliness, and 61% reported never feeling lonely. Changes in loneliness were associated with changes in marital status, housing conditions, social networks, and physical health. It is important to note that improvement in physical health and social relationships was associated with a decrease in the level of loneliness (Victor & Bowling, 2012).

There is a belief that old age and changes in social status, the loss of important social roles, and the narrowing of social circles after retirement can lead to loneliness. In addition, the modern world has seen an increase in the number of elderly people who are alone due to divorces and the death of spouses. This can also lead to social isolation and deterioration of mental health. In Southern and Central European countries, the causes of loneliness are often linked to the lack of marriage, economic difficulties, and poor health. In most countries, frequent contact with relatives and adult children, participation in public life, and support for family members play an important role in preventing and alleviating loneliness. (Fokkema, De Jong Gierveld, & Dykstra, 2012).

However, there are situations that contribute to experiencing loneliness, depression, and despair, as well as "feeling one's age": the death of a loved one and the observance of mourning, the gradual "washing out" of the age cohort of peers, the need to search for new people to fill the created "vacuum," increasing fatigue from intensive social contacts, as well as participation in solving the problems of children, grandchildren, and other relatives. E. Sapogova (2001) also draws attention to this.

Having family does not always solve the problem of loneliness in old age – for many elderly people living with relatives, the feeling of loneliness may remain just as heavy. There are enough facts of loneliness among the elderly who live with their families than those who live alone or with friends. The acute feeling of loneliness can also be experienced by those who live in seclusion from younger family members. The study by D. Perlman and his colleagues showed that loneliness is more strongly linked to contact with friends than with children and does not depend on contact with relatives (Perlman & Peplau, 1982). The researsh by Burholt, Nash & Ganguli-Mitra (2019) show that the prevalence of both moderate and severe loneliness is quite high among residents of care homes for older people.

Elderly people feel greater loneliness if they don't feel comfortable and confident in their existence, are dissatisfied with their material conditions, and don't have the opportunity to communicate with other people at their discretion. They may also experience difficulties if they are unable to engage in any activity, even non-obligatory but socially significant. Emotional support and care from loved

ones and friends are also important for the elderly. They need to feel loved, respected, and accepted, especially in old age when opportunities for social activity may be limited. Limitations in maintaining their accustomed lifestyle, lack of funds to purchase necessary items, and the inability to participate in various activities cause many elderly people to remain without contact with other people and lead to a dull and monotonous life. It is especially difficult for lonely people living in apartments and houses where the surroundings only await their death (Slobodchikov, 2007). Therefore, it is necessary to strive for the standard of living of the elderly to correspond to the average level at which they lived for many years of their lives and during their professional activities.

In addition, elderly people may face physical and psychological problems, such as illnesses and injuries, because age-related changes make them more vulnerable. They may also experience a sense of meaninglessness and loss of significance if they are not involved in social contacts and do not feel useful to society. Therefore, it is important to provide them with opportunities to participate in various events, volunteer, attend courses, and travel to help them maintain their activity and enthusiasm for life. It is important for elderly people to feel valuable and loved, for their lives to be rich in events and entertainment, rather than just boring and monotonous.

It should be noted that in recent decades, changes in social-cultural traditions and values of families and society have led to social alienation of elderly people from subsequent generations, affecting the relationship between children and parents. This is experienced painfully, especially in societies that have adhered to collectivist relationships and values for centuries. The same situation is observed in societies where there is insufficient social support for elderly people.

Today, special attention is paid in all countries to expanding the age limits of active working ability and full life activity, as well as developing ways to optimize aging. However, there are still different views on the age at which a person can be considered elderly – 60 years, 65 years, or 70 years.

Despite this, there is still a need to create even more programs and services for elderly people, especially in regions where access to them is limited. It is also necessary to pay more attention to issues of respect for the older generation, combating age discrimination, and ensuring a more inclusive environment for elderly people. The personal and social problem of aging requires a comprehensive approach and attention from all members of society.

**Method and Results.** The study of loneliness in older adults was conducted using the UCLA Loneliness Scale (version 3) by D. Russell (1996), an adapted version in Latvia by the author (Išmuhametovs, 2006), and a questionnaire aimed at identifying specific features of loneliness in older age (22 questions). The questionnaire included questions related to various dimensions of loneliness, such as emotional, behavioral, cognitive, communicative, spiritual, and others. The questions covered topics such as perceptions of aging, subjective experiences of loneliness, feelings associated with loneliness, relationships with others, peers, and communication skills, self-perception among others, reasons for loneliness, and coping strategies when feeling lonely.

Ninety-eight individuals aged 65 to 86 years, residing in various social conditions – alone, with relatives, or in nursing homes – participated in the study, which utilized the statistical analysis program SPSS.

The statistical analysis of the UCLA Loneliness Scale (version 3) characteristics showed that the mean score was 55.78 points, with the lowest score being 40 points, and the highest score being 70 (Table 1).

After analyzing the data using SPSS, we found that the sample of 98 elderly individuals (aged 65-86 years) had a mean score of 55.78 on the UCLA Loneliness Scale (version 3), with a standard deviation of 5.837. It should be noted that the mean score turned out to be higher than that of the youth age group (Išmuhametovs, 2006). (The lowest score obtained was 40 points, while the highest was 70 points. The median score was 56 points, and the mode was 30 points.

Table 1

**Statistical characteristics of the UCLA Loneliness Scale (Version 3)
for older adults (65-86 years)**

| Participants (n) | 98 |
|---|---|
| Mean | 55.78 |
| Median | 56 |
| Std. Deviation | 5.837 |
| Mode | 30 |
| Minimum | 40 |
| Maximum | 70 |

Additionally, we conducted a Kolmogorov-Smirnov test to determine whether the data were normally distributed. The results showed that the p-value was greater than 0.05, indicating that the sample was normally distributed.

To further analyze the data, we divided the sample into three groups based on the level of loneliness: low (40-52 points), average (53-60 points), and high (61-70 points). We chose these cutoffs based on previous research that has used the same scale and cutoffs.

A detailed analysis of the survey results allowed us to determine the content of loneliness among elderly people. Firstly, we examined whether there is a correlation between self-perception of being elderly and the level of loneliness. Among elderly people with a low level of loneliness, 51.7% consider themselves elderly and 48.3% do not. As the level of loneliness increases, the figures also increase. 70.2% of people consider themselves elderly, while 29.8% do not. The highest percentage (77.3%) of people who consider themselves elderly belongs to the group with a high level of loneliness. Only 22.7% did not consider themselves to be elderly. One-way ANOVA was applied to determine differences between groups. The results indicate that the differences between groups are statistically significant at a high level of significance (p<0.01).

Another question, perhaps, showed fairly predictable results. The question was whether respondents experience feelings of loneliness while being among other people. As can be seen from the survey results, respondents with a high level of loneliness more often answered that they experience loneliness. 18.1% of respondents with a high level of loneliness consider that they often experience it. In the other two groups, the percentage is significantly lower (13.3% and 7.2% respectively). In the group with a low level of loneliness, the highest percentage of respondents answered that they never experience this feeling (45.4%). In the group with an average level of loneliness, the highest percentage is for the answer "sometimes," which is 40.2%. The answer "rarely" has indicators of 27.6% in the group with a low level, 15.2% in the group with an average level, and 14.3% in the group with a high level of loneliness. All three groups have statistically significant differences.

The next question was whether elderly people feel a narrowing of their circle of communication and contacts. Among respondents with a low level of loneliness, 27.6% do not feel a narrowing of their circle of communication, 20.7% feel a slight reduction in their circle of contacts, and 51.7% feel a narrowing of their circle of communication. For people with an average level of loneliness, the indicators are somewhat balanced, noticeable narrowing of the circle of communication is observed in 40.8% of people, a slight reduction in 28.6%, and 30.6% do not notice a narrowing of their circle of contacts. In the last group with a high level of loneliness, the indicators of the narrowing of the circle of communication increase noticeably and exceed the others. 67.3% of respondents answered positively, 13.2% said that there is only a slight narrowing of the circle of communication, and 19.5% decided that there is no narrowing. There are also statistically significant differences between the groups.

The next question, "How often do you feel the desire to be alone?" showed quite interesting results among older people. 54.6% of individuals with low levels of loneliness do not have any desire to be

alone at all. 10.4% of people constantly want to be alone, 7.3% want to be alone at least once a day, and 27.7% want to be alone several times a week. In the second group with average levels of loneliness, the results are as follows: 49.8% of individuals do not have the desire to be alone, 17.4% want to be alone constantly, 12.6% want to be alone once a day, and 20.4% want to be alone several times a week. In the third group with high levels of loneliness, the situation changes completely. The percentage of people who constantly want to be alone increases significantly to 42.4%, and only 31.6% do not have such a desire at all. 6.8% want to be alone several times a week, and 20.2% want to be alone at least once a day. As expected, there are statistically significant differences between the groups with different levels of loneliness and how often they feel the desire to be alone. Various reasons for such self-isolation of people with high levels of loneliness can be assumed, from psychological protection to apathy and a desire to be left alone. A more in-depth study is necessary to determine the exact reasons.

The next question was about whether the respondents spend a lot of time among other people. According to the research results, the first group of respondents with low levels of loneliness predominantly answered "a lot," which amounted to 48.2%, and the answer "little" was completely absent. In the second group with average levels of loneliness, 7.4% of respondents already answered that they spend little time among people, and the percentage of those who said they spend a lot of time among people noticeably decreased – it amounted to 22.6%. 41.3% of individuals reported spending enough time among people. In the third group with high levels of loneliness, the situation changes even more. 38.2% of individuals consider that they spend little time among people, 44.2% consider that they do not spend a lot of time, and 9.4% consider that they spend a lot of time among other people.

According to the results, it is evident that when asked "Do you have people in your environment with whom you feel relaxed and at ease, and whom you want to spend a long time with?", the following responses were given: among people with low levels of loneliness, 62.1% have such people; among people with average levels of loneliness, 81.6%; and among respondents with high levels of loneliness, 81.8%. The results are quite interesting and likely indicate a strong need for close relationships among lonely people, a desire to be with people who they find pleasant.

According to the respondents, lonely people can be found among their peers in any social situation and among people with any level of loneliness. Based on the percentage distribution, the answers were roughly the same. The answer "often encountered" was given by 23.6% of the first group, 42.7% of the second group, and 33.4% of the third group. The answer "sometimes" was the most common response, with 42.1%, 36.6%, and 45.4%. At the same time, there were no statistically significant differences between the three groups. The results of analyzing factors that affect loneliness among elderly people, such as living conditions, gender, marital status, and education, are interesting.

The respondents were distributed as follows based on their place of residence and living conditions: 41 people in the sample live alone, 31 people live with relatives, and 26 people live in a retirement home. Among those who live alone, 11 people have a low level of loneliness, 19 people have a moderate level, and 11 have a high level. Among those living with relatives, 10 people have a low level, 15 people have a moderate level, and 6 have a high level of loneliness.

Among those living in a retirement home, there were the highest number of people with a high level of loneliness – 13 people, while 6 people had a low level and 7 had a moderate level. Based on the results, it can be observed that people in retirement homes are significantly more susceptible to loneliness than those living alone or with relatives. Statistically significant differences were not found in all groups of respondents. Differences exist between the group of people who live alone and those who live in retirement homes at a significance level of 0.05. There are also significant differences between the group living with relatives and those living in retirement homes.

In the research, 26 male and 72 female participants were involved. The levels of loneliness among male and female participants were as follows: 38.5% of men and 26.4% of women had a low level of loneliness, 50% of men and 47.2% of women had a moderate level of loneliness, and 11.5% and

26.4% of men and women, respectively, had a high level of loneliness. No statistically significant differences in loneliness levels were found depending on gender in this sample – men and women are equally susceptible to experiencing loneliness.

There were 42 participants with secondary education, 30 with vocational education, and 26 with higher education in our sample. The low level of loneliness had the following values by education level: 33.3%, 33.3%, and 19.2%, respectively. The moderate level of loneliness was observed in 35.7%, 46.7%, and 65.4% of participants. The high level of loneliness differed more noticeably – far fewer people with higher education in our sample had a high level of loneliness. Only 11.5% compared to 30.9% in the group with secondary education and 20% in the group with vocational education. Nevertheless, there were no statistically significant differences. It can be assumed that there is a tendency for a person with higher education to feel less lonely, but such an assumption needs to be tested on a larger sample.

Data of people with different marital status were analyzed: married – 28 people; divorced – 8 people; widowed – 52 people. Those who were married had a relatively high proportion of low loneliness levels – 42.8%, divorced individuals had 14.2%, and widows/widowers had 26.9%. Moderate levels of loneliness were observed in 46.4% of married individuals and 48.1% of widows/widowers. The fewest people with a high level of loneliness were among the group of married individuals – 10.7%, while divorced individuals were the loneliest – 50%, and widows/widowers had 25%. These data have statistical significance at $p < 0.05$.

**Conclusions.** The research confirms that loneliness is a prevalent issue among the elderly population in Latvia, with a significant proportion of respondents experiencing it to a moderate or high degree. This underscores the importance of addressing loneliness as a social problem among the elderly.

Psychometric characteristics of the UCLA Scale (version 3) for the elderly were obtained, which serves as a valuable tool for further research in this field. This instrument can be used to assess and measure loneliness in future studies.

The results indicate that individuals in need of close relationships are more prone to experiencing loneliness, particularly those residing in elderly care homes. This highlights the significance of fostering social connections and support networks for the elderly in institutional settings.

Marital status was found to be associated with loneliness, with married individuals being less likely to experience loneliness compared to divorced or widowed individuals. This emphasizes the potential role of marriage and companionship in mitigating loneliness among the elderly.

Interestingly, the study revealed that the level of loneliness is not dependent on gender or social status. Both women and men are equally susceptible to loneliness, suggesting that loneliness is a universal issue that affects individuals irrespective of these factors.

There is a potential correlation between a higher level of education and a lower level of loneliness, although further research on a larger sample is required to confirm this hypothesis. Understanding such relationships can help inform interventions and support mechanisms tailored to specific groups of elderly individuals.

In conclusion, it is hoped that this study will contribute to a better understanding of the groups of elderly people most vulnerable to loneliness in Latvia. The findings have implications for the development of targeted programs and services aimed at reducing loneliness and improving the overall quality of life for the elderly population in the country.

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# THE METHOD OF SCIENTIFIC MODELLING AND THE LIMITS OF ITS APPLICATION IN THE RESEARCH OF THE MIND

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**Abstract.** This article can be considered as an attempt to investigate the complex problem of the epistemic essence and typologization of models in science, as well as an attempt to determine the scope and boundaries of the modeling method in the research of the human psyche. The solutions to these issues led the author of the article to believe that the methodological analysis of the development of models in various sciences is far from complete and will continue in the coming years. The author connects the prospects of such an analysis with the logical clarification of a number of concepts and approaches related to the nature of models in science and the modeling method in general.

A separate part of the article is devoted to the genesis of the idea of modeling the functions of consciousness. In particular, in this context, the article analyzes behaviorism, the models of which do not meet the requirements of the principle of completeness. A special place is also given to the idea of computer modeling of consciousness and its justification in the form of functionalism in psychology. The spread of functionalism in the article is associated with the use of the concept of machine modeling of rational functions proposed by A. Turing and his followers. At the same time, the author of the article dwells on the critical analysis of functionalism from the standpoint of emergent naturalism of J. Searle. In this context, it is shown that the creation of effective computer programs in itself is not a sufficient basis for the absolutization of the functionalism approach. The main argument of this article is aimed at substantiating the fact that any attempt to create a strong AI cannot be successful, since the internal causal relationship between the human brain and its psyche remains unclear. Thus, the application of functionalism should be accompanied by an understanding of its scope and boundaries.

**Key words:** model in science, modeling method, machine modeling of consciousness functions, functionalism in psychology, artificial intelligence.

**1. Modeling and models in science.** The analysis of the content of numerous scientific and philosophical articles devoted to the method of modeling in science suggests that the term "model" (from Latin modulus – sample) in its modern use is quite polysemic. This ambiguity can be explained in two ways. On the one hand, the breadth and variety of subject areas in which the method of scientific modeling is used; on the other, the fact that scientists themselves, as a rule, do not deal with the problem of comparative analysis and classification of scientific models. These issues have traditionally been the area of interest of philosophers of science, who have been discussing the problems of models for at least a century. At the same time, there is no generally accepted classification of models today, which indicates differences in the understanding of their epistemic status (For example, Tolk 2015, p. 87–106).

A comparative analysis of various points of view on the nature of scientific models allows us to distinguish two dominant trends in them: (i) in some works the two–dimensionality of models is justified, (ii) in others, on the contrary, the property of their multidimensionality is revealed. In case (i), the ambivalent essence of models is revealed: that in such areas as physics, chemistry, engineering, etc., they are usually expressed in the form of various formulas and symbolic systems, which are essentially compact records of correlations identified between certain parameters of real objects. These types of two-dimensional mathematical models include stationary and non-stationary

(independent and time-dependent), continuous and discrete, deterministic and stochastic, unambiguous or probabilistic, etc. models (For example, Кубланов 2004, p. 15). Among them, for example, a model of the general circulation of the atmosphere based on the Navier-Stokes equations; or – a model of the DNA double helix; or – models of the general equilibrium of markets, etc. Thus, it can be concluded that in the part of analytical works devoted to the study of the problem of the epistemic essence of models, they are mainly understood as compact symbolic (primarily mathematical) representations (imitations) of the revealed patterns in the behavior of objects in the real world (Forster, Myung 2000).

In the approach (ii) to the problem of the specificity of scientific models, the authors, on the contrary, point to their multidimensionality. For argumentation, references are made to numerous full–scale and technical models, of which there are many in the history of science, especially in natural science and engineering sciences. At the same time, multidimensional models include both living and inanimate objects of nature, including mice, rats and even stuffed animals in various museums, as well as various models of technical devices, including imitation games and children's toys. It is argued that research activities with such simulating objects allow us to represent patterns in the functioning of many complex real objects, such as, for example, objects of microbiology or human physiology. As a vivid illustration of one of these multidimensional scientific models, we can call an interactive three-dimensional atlas that displays the various stages of human embryo development from the moment of conception to two months. This model, developed by a group of Dutch scientists, was published in (de Bakker 2016).

As for the problem of typology of models in science, the analysis shows that their classification is carried out on different grounds, depending on how the authors understand the ontological and epistemological nature of objects and methods of their modeling. For example, the criterion of some classifications is the type of simulated objects (natural, technical, logical, pedagogical, atomic-molecular, etc.), for the development of others – technologies and their applications (mathematical, graphic, structural, functional, explanatory, test, heuristic, computer, economic-mathematical, statistical, etc.), for the third – mixed species – forming features (Bokulich 2003, p. 609–627). In this connection, of course, the question arises about the fundamental possibility of constructing a universal classification of models. As an answer to it, I think we can once again refer to the above argument. The main difficulty in explaining the differences in the classifications of models in science is that one has to mentally cover an extremely wide range of subject areas of their application. This circumstance is the basis for the assertion that the prospect of developing a "rigidly" coordinated typology of scientific models is unlikely. At the same time, there is no doubt that in accordance with the requirements of taxonomic and mereological logical divisions, existing classifications can be coordinated within an integrated system. This is an important perspective, since a comparative analysis of existing classifications shows that they are not always even logically consistent with each other (For example, Models in Science 2006, 2020).

The above considerations regarding the differences in classification and understanding of the ontological and epistemological essence of scientific models indicate that the methodological analysis of their development and use in various sciences will continue. Moreover, this analysis should not be considered as an end in itself, it is a methodological need: optimization of the modeling method according to various criteria is important for the further development of prospects for its application in scientific research, in particular, in the field of cognitive psychology and artificial intelligence. It seems that new modeling studies in science will be multi-subject, i.e. they will be aimed at finding different perspectives and aspects of the development and use of models. Among these aspects are: (i) methodological (study of the processes of model development in their correlations with the types of research problems and objects); (ii) semantic aspect (differentiation of semantic functions of the use of the concept "model" in different sciences); (iii) the ontological aspect, i.e. clear identification of

denotations (real or imaginary) with which models in science relate; (iv) epistemological aspect (studies of how models used change perceptions and understanding of real subject situations); (v) systemic aspect (demonstrating how models are interfaced with various scientific theories and hypotheses).

**2. The general structure and elements of the modeling process in science**. Based on the results of the analysis of the content of discussions on the complex problem of scientific models, here, first of all, it is advisable to clarify a number of concepts related to their nature and the method of modeling in general. Let us assume that the need for models arises in any science, especially in those studies that are aimed at objects of reality that are inaccessible to their direct study. Models in science will be understood as a necessary resource for the indirect study of any objects that are not directly perceived, or such objects that cannot be accessed for ethical reasons. Objects of this kind are found both in the study of the physical world, for example, atmospheric conditions, the Earth's crust, underwater currents, micro- and mega-world phenomena, and in the study of animal and human organisms, their mental states, social and political situations, past events, etc.

Under the term "scientific modeling method" we will understand a set of principles (guidelines) implemented in the form of a sequence of stages of cognitive actions aimed at some classes of special (modeling) *Oa* objects that are selected (or invented) as similar in some respects to various sets of real *Ob* objects (originals, prototypes). *Oa* sets thus provide simulations of some *Ob* features; these features can be selected by researchers (*Rs*) in terms of essential properties, structures or elements of *Ob*. As for the choice of *Ob* themselves, it is determined by the problems and goals of research.

Analyzing the use of the term "scientific modeling method" in the scientific literature, we note: usually this term is used in an expansive sense – as an indirect way of obtaining information, the interpretation of which gives knowledge of the object under study. For comparison: the meaning of the concept of "method" fixes a clearly formulated rule regulating a certain order of specific cognitive operations. Given this circumstance, it is important to keep in mind that modeling in the real practice of scientific research is not actually a method. In reality, the phrase "method of scientific modeling" refers to a research strategy that includes several stages of cognitive actions.

(1) The first stage of the process of creating models in science can be described as follows. Let some researcher (including a research team) *Rs*, solving a scientific problem, plans cognitive actions with a set of *Ob* objects selected in accordance with the scientific problem being solved. Based on his initial knowledge of $Z_i^0$ about the set of *Ob*, as well as by analyzing the results of various *Tbg* studies previously conducted by other authors, *Rs* can choose (or invent) some other set of *Oa* objects. This set is such that it is considered as analogous in a strictly defined relation (properties, elements or structures) to the set *Ob*.

In order to establish such a correspondence (analogy) between the original *Ob* and *Oa* objects with different properties, connections, structural similarities, etc., *Rs* undertakes search actions, including using the analogy method and heuristic principles (Forbus et al. 2017). Success in finding (or inventing) *Oa* is recognized if *Rs* turns out to be able to formulate a fundamental model (idea) *M₀*, i.e. some hypothetical initial statements $Z_{0i}$ about the set of *Oa*, as well as statements $X_i$ that reflect the relationship between *Oa* and *Ob* (Giere 2010, p. 269-281). From a logical point of view, this also means that from the initial hypothetical statements $Z_{0i}$ about the set *Ob* and $X_i$ are deduced (logically follow) the initial statements of $Y_{0i}$, which should be checked at the next stages of modeling and expressed in the form of *Yi*. Let's write it symbolically: $Z_{0i}X_i \vdash Y_0I \vdash Yi$. In this entry, the symbol $\vdash$ reads: "from statements … deduced …", or "… logically follows …". The totality of $Z_{0i}$, $X_i$ and $Y_{0i}$ determines the initial content of the principal model *M₀*, i.e. the hypothetical design of the future model *M*. In general, M₀ expresses a complex system of relations and connections between *Oa* and *Ob*, which allows, as a result of studying *Oa*, to obtain new statements *Yi*, the totality of which determines the content of *M*. This content is further interpreted as statements by $Z_i$ about the expected properties of *Ob*. It can be said that following such a methodological principle legitimizes the use of the similarity principle

as a methodological basis for determining the epistemic relations between the set of *Oa* and reality in the form of a set of *Ob* objects.

Since the function of modeling *Oa* objects in research is to perform the function of a substitute (representative) of the *Ob* class (original objects), *Oa* objects are necessary in cases where direct study of *Ob* is impossible, for example, due to their inaccessibility to direct perception. At the same time, since individual objects combined into sets of *Ob* can have a large number of different properties, when searching for or inventing *Oa*, the following two circumstances must be taken into account. Firstly, from the point of view of research purposes, the set of *Oa* should reproduce all the essential properties of *Ob*. This requirement – "*Oa* must have all the essential features of *Ob*" – is called the principle of completeness. Secondly, when searching for or inventing *Oa*, it is also necessary to abstract from some properties of *Ob*. Thus, the properties of the *Oa* object classes turn out to be, on the one hand, idealized due to the principle of completeness, and, on the other, simplified and approximate. Such ontological ambivalence of "analog objects" (i.e. *Oa*) may lead to the fact that when studying *Ob* by modeling, one has to choose (or invent) several sets ($Oa_i$). Accordingly, more than one model (i.e. $m_i$) can be developed.

(2) At the second stage, through the efforts of *Rs*, in accordance with $M_0$, cognitive actions with a set of *Oa* are realized (*Oa* can also be reduced to an individual subject a). The ultimate goal of these actions is to gain knowledge, i.e. the true statements of $Z_i$ about the *Ob* class. The research activities of the second stage are divided into two types: (1) obtaining statements – *Yi* models about *Oa* subjects; (2) transition by means of special rules of interpretation *Yi* to statements $Z_i$. The rules of transition from *Yi* to $Z_i$ are specially developed for each specific model study, which ensures the interpretation of *Yi* about the introduced objects of *Oa*, and also allows you to obtain on their basis a set of statements of $Z_i$ (knowledge) about the original objects of *Ob*. Thus, the set of *Oa* at the second stage of the model study is studied as an independent class of objects; without them, scientific understanding and explanation of the corresponding class of *Ob* objects is impossible. A variety of methods are used as means of studying *Oa*. In the most developed sciences, for example, "model" experiments occupy an important place in research of this kind. They have become widespread not only in the exact sciences, but also in experimental psychology (*Крылов 2010*). Such experiments can take various forms: often, for example, purposefully change the conditions of functioning of *Oa*, and the *Yi* obtained in this case are compared and systematized.

(3) The third stage can be called analytical. It basically boils down to a comparative analysis of all new statements obtained in the course of research, *Oa* and their interpretation as a model *M* for the formation of knowledge about the original *Ob*. Let's explain this: the whole set of statements is divided into three subsets: $X_i$, $Y_i$, $Z_i$. Each of them displays the properties of *Oa* in its own way or is related to them. Thus, the specificity of the statements $X_i$ is that they are descriptions of the similarities and differences of the properties of *Oa* in comparison with *Ob*. Without $X_i$, it is impossible at the first stage to determine the content of $M_0$, i.e. the principal model of *Ob* and the choice of *Oa*, nor the further interpretation of the *Yi* complex as a model of *M* for obtaining $Z_i$ – knowledge about the set of *Ob*. At the same time, $X_i$ can display the identity of some properties of *Oa* and *Ob*, or be a description of the similarity of their structural elements, or an expression of mathematical equations symbolically representing the functions of objects *Oa* and *Ob*, or their similarity. Another set of statements – *Yi* – is not identical to $X_i$ and is a description of the results of studying the set of *Oa* by various methods. Among these methods, for example, are observations, testing, experimentation, mathematical descriptions, etc. The analysis of *Yi* obtained as a result of cognitive actions with *Oa*, as well as their interpretation, suggest a transition from *Yi* terms in the model *M* to terms forming statements $Z_i$, i.e. to the expression of the knowledge obtained about *Ob* – o the class of originals (prototypes) modeled by the class *Oa* (where *a* are individual objects-models relative to individual objects *b*).

The statements $Z_i$, as well as $Y_i$, are not identical to $X_i$. When the previous stages of the model study are carried out successfully, $Z_i$ are logically deduced from the conjunction of statements $X_i \& Y_i$ and determined by their interpretations. If the $Z_i$ checks are successful, then it means that the choice (or invention) **Oa** and the development of the model **M** were adequate with respect to the studied set of **Ob**; or, to put it another way: **Ob** is the original model of **Oa**. In this case, the introduction into the structure of the theory of **T** of conjunctions of statements $X_i \& Y_i$ as various kinds of premises or conclusions ($X_i \& Y_i \rightarrow Z_i$, etc.) provide the validity of **T**, which allows us to further construct various descriptions and explanations of the laws of the properties of the set Ob.

(4) The fourth stage is verification: it boils down to verifying the content of **M**, i.e. to searching for confirmations of $Z_i$, since **M** is an imitation of **Ob**. These model knowledge (**M**) only replaces as analogies some essential features of **Ob**. This is necessary because if **M** were identical to the original, it would cease to be a model. In addition, if all the essential features of **Ob**, when imitated in **Oa**, would differ from the original, then **M** would also not be a model. Thus, in model studies, the study of some features of the simulated set of **Ob** objects is always carried out at the cost of refusing to study other aspects of the same set. The verification of $Z_i$ leads to an adjustment of **M** taking into account those properties of **Ob**, from which they were abstracted or idealized at the first stage when choosing (or inventing) **Oa**. Shortcomings, **M**, identified after the first cycle of **Ob** modeling, due to insufficient knowledge of its properties or errors in the development of **Oa**, are usually corrected in subsequent modeling cycles.

**3. The genesis of the idea of modeling the functions of consciousness**. The history of science shows that models as a means of studying and understanding various real objects have been used by people since ancient times. At the same time, modeling has been used exclusively for studying nature and creating technology for at least 2,000 years. However, the growth of knowledge and scientific interest in new problem areas has led to attempts to model some functions of consciousness since the Renaissance. In this regard, it is important to note the work of the philosopher and logician Raimond Lull (1232/35-1315) "Great Art" ("Ars Magna") (Yates 1954, p. 115-173). It was the first to express the concept of a mechanical model as a complex device (a "mechanical computer") capable of simulating the functions of the mind. Moreover, the idea of the "Ars Magna" device included not only mechanical imitation of arithmetic operations, but also imitation of logical schemes of syllogistic reasoning. It remains to be regretted that R. Lull failed to fully implement this project "in hardware" due to the lack of skill of the mechanics of that time.

The category of logic machines similar to "Ars Magna", although not so large-scale, can also include various computing devices created in the Late Renaissance, such as abacus (XV-XVI century.), slide rule (early XVII century.) and arithmometers. Examples of the creation of all these devices (especially "Ars Magna") indicate that by the first half of the XVII century. in science, a primary interest in the imitation of intellectual functions had already been formed and the first experience of searching for ways of such imitation had accumulated. In this regard, we can talk about the genesis of the research ideal of creating artificial intelligence (AI). There is no doubt that the first tests of the realization of the AI ideal in the form of computational mechanical models played an important heuristic role in the further development of the modeling of consciousness functions and the methodology of scientific research. Thus, the history of science shows that the heuristic potential of "Ars Magna" was significant not only for Renaissance thinkers, but also for many great researchers in the field of logic and epistemology of later eras. Among them: M. Montaigne, B. Pascal, R. Descartes, G. Leibniz, I. Newton, etc. (For example, Steihaug 2020).

The direct connection of R. Lulli's ideas with the works of Blaise Pascal (1623-1662) and Gottfried Leibniz (1646-1716) is especially obvious. It was the ideas of R. Lulli that inspired B. Pascal, who designed a machine for performing arithmetic operations. Later, the concept of creating a mechanized model of inferences was theoretically developed by G. Leibniz in his work "On the Art of

Combinatorics". It was on the basis of the principle of combinatorics that he created and improved his main technical invention: an adding machine that performed all 4 actions with multi-digit numbers. (Pascal's first arithmometer could only add and subtract) (Fidora, Sierra 2011, p. 36-38). The last and final version of the device was made in 1710, but G. Leibniz made a description of it already in 1673 at a meeting of the Royal Society of London. At the same time, he tried to combine his discoveries in the Analysis of Functions and in computer technology into a new integral science (Jones 2016, 56–87). Today we call it "Artificial Intelligence".

Speaking about the first attempts to model some functions of the mind, it is important to note that for a long time they were developed exclusively as mechanical computing devices – a slide rule, an adding machine, calculating and solving mechanisms, etc. This fact indicates that the research ideal of theorists and inventors of mechanical calculating devices was to carry out simulations and to optimize exclusively the intellectual function of human consciousness with the help of technical devices. Interest in understanding and modeling other mental functions received an impulse of development only in the twentieth century.

**4. Models of behaviorism.** In the twentieth century, J. Watson and E. Thorndike proposed a new ideal for the scientific study of consciousness. They focused the research of a person's mental life on describing the facts of his behavior, which could be logically linked with an understanding of the functions of the human psyche. This ideal was important in the sense that it provided researchers of the psyche with an objective scientific approach. He was generally accepted by B.F. Skinner, but proposed a new strategy for a holistic understanding of the psyche through the use of a model that was previously known in physics as the "black box model". This model was used to recreate the mechanism of functioning of any complex system, the internal structure of which is unknown. B.F. Skinner drew attention to the fact that the "black box" can be promising within the framework of the behaviorism approach to the study of the psyche. Influencing a person, or animals, for example, rats, from the outside, it is possible to record their responses. On this basis, it was proposed to build behavioral models that allow not only to explain the processes of the human psyche, but also to predict mental reactions to various situations. The established tradition of modeling the psyche has been called "psychology of the black box" (Skinner 2014, p. 46–90).

The advantage of the "black box psychology" model is that it provides for the study of a person without making any ontological commitments regarding the nature of the psyche itself. Such abstraction, as already noted above, is inevitable in the framework of any application of the modeling method in science, including in psychological research. Modeling in psychology necessarily involves simplifying the studied subject situations, which is due to the fact that neither emotions, nor will, nor thoughts are almost inaccessible for their objective study. Therefore, consciousness in the "black box models" is explained by searching for and describing correlations between stimuli on humans (or animals) and behavioral responses to these stimuli. Thus, in one of the versions of behaviorism – in the logical-linguistic behaviorism of Gilbert Ryle – only one subclass of mental states was analyzed – dispositional states, i.e. beliefs, intentions, motives and desires (Ryle 2009, p. 101-130, 137 – 174). From the point of view of Mr. Ryle, to be in a certain mental state means to be in a certain behavioral state or in a predisposition to such behavior (Ryle 2009, pp. 292-303). At the basis of such models, for example, in the G. Ryle model, explaining the mental phenomena of a person, there are statements about a person's response to stimuli from the external environment (S→R). Thus, behaviorist models of human mental states are certainly objective, but they are also limited, since many mental phenomena are out of the focus of research in them, access to which is possible only in the form of introspection.

**5. Factor models of personality.** Among the models developed in the field of psychology, a specific place is occupied by the so-called "factor models of personality". They were mainly developed between the second half of the 1940s and the 1960s. The most famous of their two versions: "PEN

H. Eysenck" and "R. B. Cattell's 16-factor model". Each of these models was the result of an analysis of empirical ways of describing personality traits of many individuals (including on the basis of their self-descriptions). To construct the models, data from self-reports (answers to questionnaires, using predicate scales), data on the behavior of a relatively large number of participants studied, as well as expert assessments of external observers of the behavior of the subjects were used (Eysenck 1992, p. 667-673; Cattell 1984, p. 121–174).

The usual sample consisted of several hundred people; this was the case, for example, when developing the 16-factor model of R. B. Cattell. The processing of the received lists of words and phrases characterizing a person's personality traits was made out in the form of various questionnaires, which underwent a secondary check for the presence of these traits in the examined people. Then the generalization of the selected personality traits into factors was carried out by highlighting correlations with each other. At the end, with the help of sequential application of factor analysis, the number of generalized factors of the 2nd and 3rd order was brought to a small list (3, 5 and 16 factors, respectively 10).

Of course, the question arises about the objectivity of factor models of psychology and how they differ from models of physics or biology? It seems that this question can be answered as follows: They differ from models of physics or biology, as much as a person as an integral psychophysiological self differs from his physical, biological and mental components. At the same time, it is important to note that the development of factor models has largely determined what psychologists and philosophers now understand by the term "human personality".

**6. The idea of computer modeling of consciousness**. An analysis of the history of modeling the functions of consciousness suggests that functionalism occupies a particularly important place in it: today it is regarded by many as the main methodological approach in scientific psychology. Its origins should be connected, on the one hand, with the influence of behaviorism and factor models, and, on the other, with the success in using computing machines (computers) in modeling some functions of consciousness. Among these attempts, the most important are the works of the British mathematician Alan Turing (1912–1954).

In the early 30s of the twentieth century, while studying the prospects of using mathematical logic for practical purposes and reflecting on Godel's incompleteness theorem, he justified the possibility of replacing the universal formal arithmetic language with logical schemes of simple hypothetical devices in it. A. Turing in an article published in 1937 gave a fundamental description of the imaginary device of a logical machine: "We can compare a person calculating a real number with a machine that is capable of fulfilling only a finite number of conditions $A_i$ and $q_i$, which will be called "m-configurations". The machine is equipped with a "ribbon" (analogous to paper) passing through it, and divided into sections (called "squares"), on each of which a "symbol l" can be applied. Write a number or letter instead of 0. It can also shift to the right and overwrite 1 with another digit or letter. Thus, by changing its m-configuration, the machine can effectively memorize some characters that it "saw" (scanned) earlier.» (Turing 1937, p. 231–232). In essence, in his article A. Turing talks about various schemes of formal calculations as actions. He showed that depending on the conditions and "configurations", it is possible to obtain their various models, which can be implemented in devices. Subsequently, these various models became known as "Turing machines".

A. Turing proved that any device capable of shuffling the simplest symbols according to the algorithm, for example, "0" and "1", can perform any mathematical calculations. Thus, the Turing machine is an imitation model of formal reasoning. It is capable of simulating logical schemes of thinking by means of numbers, the general essence of which can be expressed in the form of a fundamental formal logical scheme: if such and such input data ($A_i$ and $q_i$) are obtained, then such and such ($a_i \rightarrow a_i{}^l$) state of the machine arises; or if the machine is in this ($a_i \rightarrow a^l{}_i$) state, but no input data is received ($a_i \equiv 0$), then it goes into a new state: $a_i{}^2 \rightarrow a_i{}^3$, etc. This algorithm in the language of symbolic logic

is displayed formulas implicative discourse: $a_i \rightarrow a_i{}^l \& a_i \models a_i{}^l$ ; $a_i \equiv 1 \rightarrow a_i{}^l \equiv 1 \& a_i \equiv 1 \models a_i{}^l \equiv 1$; $(a_i \equiv 0 \rightarrow a_i{}^2) \rightarrow a_i{}^3 \& a_i{}^3 \equiv 0 \models a_i{}^2 \equiv 0$... etc.

The device of the Turing machine is extremely simple. The complex of its elementary operations is much simpler than the very first computers. The Turing machine has two input channels (ai, qi) for information supply and three output channels (***ai+1, qi+1, Di+1***). Processing of information and issuing commands to record the sign and shift of the tape is performed by a logical device (***LD***).



**Fig.1 Schematic diagram of the Turing machine device**

If we approach the Turing machine from the point of view of the foundations of its schematic diagram from an epistemological point of view, the basis is the hypothesis that mental acts (processes) are special human states, which, on the one hand, depend on the effects on us ("at the entrance") of various sensory stimuli, and, on the other, – expressed in the form of intellectual reactions ("at the exit"). Thus, thought processes (states) are formally defined as cause-and-effect relationships between stimuli on a person and his reactions ("at the exit") to incoming information. This gives reason to call a person and his intellectual activity (in principle, any other organism or device) metaphorically "a system capable of processing information.» The order of the functions of any such system is recorded in the form of a computer program that simulates the variety of its states, depending on the stimuli "at the input". For example, utterances are functions of a person as a system processing information. At the same time, the machine model of thinking can, in principle, be implemented on various physical structures.

In 1936–1938, John von Neumann got acquainted with the ideas of A. Turing and continued the development of machine models of thinking. The last one wrote: "Turing showed that all machine computing is based on a very simple mechanism. Since the Turing machine (and, consequently, any computing machine) is able to determine the further course of action based on the results of previous operations, it is able to make decisions and model arbitrarily complex hierarchies of data (Neumann 2012). The works of J. von Neumann, as well as the ideas of the participants of the Dartmouth Summer Research Seminar on Artificial Intelligence (Dartmouth College, 1956) became the basis of a new field of research called "Artificial Intelligence" (AI). The basic thesis of AI adopted at the Dartmouth Seminar: "Every aspect of learning or any other property of intelligence can be described so accurately that that you can create a machine to simulate it.» He fully met the general goal of AI set at the seminar – to achieve machine intelligence (Solomonoff 1957, p. 56–62).

The results of the research of the computer systems theorist A. Turing, in particular, the famous article "Computing Machinery and Intelligence" written by him after the war, prepared for the philosophical magazine "Mind" in 1950, had a huge impact on the formation of the most influential tradition of the study of consciousness, called "functionalism". A. Turing demonstrated the logical possibility of "machine intelligence", i.e., a model that is understood as a device that simulates mental activity. A. Turing's strategy was confirmed by the results of the test, which later became known as the "Turing test". The test conditions were formulated as follows. (1) The states of a computer running a certain program are determined by checking the relationship between the input data (the question to which the correct answer must be found) and the output data (the correct answer). (2) If the machine manages to find the answers to the questions correctly and it is impossible to distinguish the answers of a person from the answers of a computer, then it is recognized that the machine passed the test successfully.

**7. Functionalism as a methodology for modeling the psyche.** Functionalism is a research approach that has been recognized since the 60s of the twentieth century as a scientific methodology for the study of the psyche. The spread of functionalism, firstly, was due to the fact that it overcame the lack of behaviorism, which is characterized only by the analysis of the behavior and dispositions of people (or animals) as reactions to stimuli from various environmental factors. Secondly, as already noted, the experience of using the concept of machine modeling of rational functions proposed by A. Turing and his followers was adapted to functionalism. Advances in AI are considered in functionalism as an important way of testing and practical use of psychological theories.

In methodological terms, the essence of functionalism is to search for correlations between data on stimulatory effects on the "inputs" ("in put") of the organism and data on its "outputs" ("out put"). In addition, he is characterized by a close interest in the study of any mental states of the body (emotions, volitional acts, expectations, etc.), provided that an objective check of their functioning is possible. We are talking about the verification of ideas about these states: it is checked how they are expressed at the level of "outputs" – in behavior, language narratives, facial expressions, pantomimics, etc. The resulting descriptions of correlations of dependent and independent variables can be used as a basis for the development of software descriptions of machine models or robots that simulate the functions of consciousness (For example, Putnam 1975, p. 408–428).

If we consider functionalism from the standpoint of analytical philosophy, then it can be characterized as follows. In ontological terms, functionalism does not require the identification of the states ($P_{\varphi i}$) of the psyche with either neuro-physiological or with some spiritual structures of the human body. In other words, when describing and explaining mental states in mental predicates $P_{\varphi i}$, there is no need to reduce these states to the brain or other neurophysiological structures $ob_{\varphi i}$ of a person (or other organisms). From the point of view of functionalism, the mental properties of $P_{\varphi i}$ should be considered only as functions (actions) of $Ob_{\varphi i}$ (i.e. $P_{\varphi i}(Ob_{\varphi i})$). Thus, functionalism is methodologically more universal and less dogmatic compared to various versions of monistic physicalism, behaviorism or dualism (Putnam 1960, p. 138–164). For example, unlike "identity theory" ("eliminative physicalism") or "reductive physicalism", in functionalism mental states are complex states that are considered as a set of emergent properties of the whole organism; they are the functions of an integral system, and not the properties of some components of the body (brain and central nervous system or disembodied spirit).

It is especially important that functionalism differs methodologically favorably from behaviorism, despite the similarity with the latter. If behaviorism correlation between behavioral reactions $Q_{\varphi i}$ people ($Q_{\varphi i}(Ob_{\varphi i})$) and various factors $S_i$ the external environment are considered as the basis for the explanation of the mind, the functionalism behavioral condition $Q_{\varphi i}(Ob_{\varphi i})$ considered in their correlations with external stimulus effects (i.e. $S_i \rightarrow P_{\varphi i}(Ob_{\varphi i})$), and correlations with deeper States of holistic human self ($F(Ob_{\varphi i})$), including with "background" (initial) mental states $P_{\varphi i}(Ob_{\varphi i})$, from which behaviorism is abstracted. Thus, the most important difference between behaviorism and functionalism is that in the latter mental states ($P_{\varphi i}(Ob_{\varphi i})$) they are understood not as acts of behavior, but as their causes. In symbolic notation, this thesis looks like this: $S_i \& F(ob_{\varphi i}) \rightarrow P_{\varphi i}(Ob_{\varphi i})$.

It seems that the focus of functionalism is the idea of the possibility of circumventing the solution of the problem of the parity of the structures of the psyche and body. The principle of ontological neutrality ensures the impartial objectivity of functionalism – the basis of a research program (or paradigm) for the creation of scientific psychology. Within the framework of this program, the question "What is consciousness?" the answer may follow in the form of another question: "How does consciousness function?". In functionalism, descriptions of sensations of pain, hunger, anger, expectations, etc. states ($P_{\varphi i}(Ob_{\varphi i})$,) are replaced by mappings (including symbolic) states of all organisms. From the point of view of functionalism, it is only important how mental states are expressed (objectified), performing a particular functional role, as well as the regularity with which these functions are

repeated. The results of cognitive actions to identify psychological regularities result in the construction of behavioral models, the interpretation of which is the basis for the nomination and verification of statements about the similarity of psychological models and the real mental life of people.

**8. The boundaries of functionalism in the modeling of consciousness**. Despite all the advantages of functionalism, which are obvious in comparison with behaviorism, in the last 25 years this approach has been subjected to critical analysis. Among the analytical works on the problems of functionalism, the texts of John Searle (1980) and David Chalmers (1996) are especially significant (Searle 1980, p. 417–424). In their works, the sharp edge of criticism is directed precisely at the adherence of functionalism to the "principle of neutral monism". In this article, as an example, we will briefly touch on one of them – the concept of J. Searle.

J. Searle, a representative of analytical philosophy, introduced several important concepts into the discussions on the methodology of functionalism: "emergent naturalism", "strong artificial intelligence", "weak artificial intelligence", and also proposed a thought experiment that led to a revision of the boundaries of the application of functionalism in research of the psyche. Analysis of J. Searle's critique of functionalism and his thought experiment can be represented as a description of two sequences of actions. Firstly, they boil down to the acceptance of 2 hypotheses: (1) "If the concept of "strong artificial intelligence" is correct ($Tr$), then there is a computer-type transliteration program that allows a person who speaks only one of the European languages ($Q$) to understand Chinese written texts by entering them into a computer that provides an adequate translation of these texts into this European language ($R$)"; this hypothesis can be written as the formula: $Tr \rightarrow Q\&R$.

Hypothesis (2) can be expressed as follows: "If, without knowledge of the Chinese language ($N$), in accordance with the algorithm developed by programmers, the translation of the text from Chinese into European ($R$) is provided, then the translation of the text from Chinese into European is recognized as correct ($S$), i.e. corresponding to the algorithm of programmers, as well as the translation is considered adequate provided that it is understood ($T$) by a European who does not know Chinese characters"; the hypothesis can be written as the formula: $N\&(Q\&R) \rightarrow S\&T$.

Secondly, in accordance with the idea of J. Searle, the accepted hypotheses can be tested through a thought experiment called the "Chinese Room". According to this experiment, an imaginary room in which a certain person is located can serve as an analogue of a computer operating in accordance with a program written by programmers and capable of imitating the human function of understanding Chinese. It simulates the actions of a computer, using instead of lexical signs of the European language, hieroglyphic signs and formal rules for establishing correspondence between them. This person does not know any Chinese characters and, when receiving a question in Chinese, acts according to instructions; he manipulates hieroglyphs. The rules define the manipulation of Chinese characters only formally, i.e. syntactically; there is no information in the instructions about the possible semantic meanings of these characters. The instruction is structured so that after all the answers to the questions are made, they are converted into hieroglyphs of the answers. In fact, the instruction is a kind of computer program (algorithm), and the person in the room executes the algorithm in the same way as if a computer did it.

In the "Chinese Room" thought experiment, a situation is assumed when an observer sends a meaningful question to the room (for example, "What color do you like?") and receives a formally adequate answer (for example, "blue"). At the same time, the person in the room answered the question purely according to the instructions, since he does not own hieroglyphs, and cannot learn how to use them without knowing their semantic meanings. In other words, he does not understand either the meaning of the question or the answer he has chosen (according to the instructions). But the observer, in turn, can be sure that there is a person in the room who knows and understands Chinese characters.

Analysis of the results of the thought experiment allowed J. Searle to draw attention to the limitations of the scope of the functionalism approach. He meant that computer models developed on the

basis of the results of this approach can pass the Turing test, but this does not mean that the formal correctness of the results (**S**) of the application of the functionalist description of people's mental states ensures an adequate understanding of their true nature (i.e. **T**). Therefore, hypothesis (2) has not been tested in a thought experiment. Thus, the hypothesis "If the concept of "strong artificial intelligence" is true (**Tr**), then there is a computer-type transliteration program that allows a person who speaks only one of the European languages (**Q**) to understand Chinese written text" should be rejected as false.

**Conclusion.** Analysis of the history of the use of the modeling method in the study of the psyche and consciousness allows us to join the consensus that models perform a number of important epistemological functions. In particular, with their help, it was possible to simulate some aspects of such processes and properties of the psyche as logical thinking, memory, learning ability, etc. However, it does not follow from this that functionalism as the main approach in modern psychological research provides a complete understanding of a person's mental life. It has its limitations, which are associated with the unresolved problem of the relationship between the neurophysiological and mental levels of a single human self.

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# CONNECTION OF THE ACADEMIC ACHIEVEMENT MOTIVATION WITH SELF-ESTEEM AND ANXIETY OF STUDENTS

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**Abstract.** The goal of the paper is to investigate connection of academic achievement motivation with aspects of self-esteem and anxiety. Hypothesis: Academic achievement motivation is connected with self-esteem and also with anxiety of students. Participants: 107 international students aged 19-55. Results: Academic achievement motivation was connected with global, state, performance, social and appearance SE. Academic achievement motivation was also connected with general, trait and state anxiety. Conclusion: Self-esteem and anxiety are significant elements in formation of academic achievement motivation.
**Key words:** academic achievement motivation, anxiety, self-esteem.

**Introduction.** For many people, higher education is a ticket to better health, more happiness, higher income and higher life satisfaction (Cheung & Chan, 2009; Stryzhak, 2020). Success in studies is known to be partially predicted by achievement motivation (Robbins et al., 2004; Akbas & Adnan, 2007; Hustinx et al., 2009). However, not all students attending higher education feel motivated towards their studies, risking all the benefits that the higher education could bring them and their community.

What makes some students strive for success, while others lose interest and feel unmotivated? What explains the individual differences in academic achievement motivation? This paper will take a look at this problem from the perspective of self-esteem and anxiety.

Self-esteem has been previously positively associated with academic achievement motivation (Nwankwo et al., 2013; Basco & Han, 2016; Bhatt & Bahadur, 2018) and anxiety has been negatively associated with academic achievement motivation (Mehrabian, 1994; Fathi-Ashtiani, 2007; Basco & Han, 2016). Outside the school context, the relationship of achievement motivation with self-esteem and anxiety has been studied in sport and performance psychology. The results have demonstrated similar positive connections between self-esteem and achievement motivation (Maleki et al., 2011; Ozrudi & Matmask, 2019; Abdelkader et al., 2022) and negative connection between anxiety and achievement motivation (Khan et al., 2011; Sabti et al., 2019; Wang, 2021).

Aim of the research: To investigate the connection of academic achievement motivation with self-esteem and also anxiety of students. Hypothesis: Academic achievement motivation is connected with self-esteem and also with anxiety of students.

**Theoretical basis.** Achievement motivation is defined as the desire to perform well and be successful. Individuals high in achievement motivation are ready to master difficult challenges, to set high standards for themselves and to work with perseverance to achieve these standards (American Psychological Association, 2022a).

Self-esteem is defined as the degree, to which the self-evaluation of one's characteristics are positive. It reflects the individual's image of their capabilities, accomplishments, values, mental and physical conditions as well as perceptions about how others respond to the individual (American Psychological Association, 2022c).

When individuals evaluate their characteristics, they are drawing on an information which is stored in their self-concept, and as such the self-esteem is considered to be part of self-concept (American Psychological Association, 2022b; Rosenberg, 1965). Conscious contents of self-concept can be

examined and appraised by the individual. This process, where people evaluate their specific characteristics, traits or abilities has been called self-evaluation or self-appraisal (Brown et al., 2001).

Self-esteem has been conceptualized in many ways. Some, like Rosenberg (1965) view self-esteem as unidimensional construct, but more currently self-esteem has started to be viewed as construct consisting of multiple dimensions. Example of these are trait and state self-esteem (Heatherton & Polivy, 1991). Trait self-esteem is considered to be relatively stable over time (Trzesniewski et al., 2003), while state self-esteem is sensitive to situational and contextual changes (Heatherton & Polivy, 1991).

I argue, that achievement motivation and self-esteem are theoretically related, as both of them contain same self-evaluative element.

Rosenberg (1965) defined self-esteem as a sense of self-worth and Branden (1969) as a relationship between individual's competence and worthiness. According to Branden, individual accumulates self-esteem by facing challenges and succeeding at it in a worthy manner. The common component is the presence of evaluative element, as the individual is the one who evaluates his or her successes and failures, assigning meanings to each of them. Same element is found in multiple conceptualizations of achievement motivation. For example, in Need achievement theory the achievement motivation is characterized as combination of affect and evaluated performance. Individual feels the desire to achieve something, which can be then evaluated by individual himself or by others (Atkinson, 1974; McClelland et al., 1953; McClelland, 1961).

The Need Achievement model can be interpreted as containing two elements: (1) the cognitive element in which individual engages in assessment of the situation and (2) the behavior element, in which individual acts to fulfill their motivations. The cognitive element is not only related to assessment of situation, but also the evaluation of one's own abilities and chances of success.

Same idea is reflected in Expectancy-value theory (Wigfield & Eccles, 2000). There the achievement motivation of an individual consists of their expectation of the success, beliefs about own abilities and task valuing. When individual believes in their abilities, believes in probability of success and values the task at hand, they are likely to have high achievement motivation. The belief in one's own abilities can be considered to be the self-evaluative element. Same is reflected in Self-efficacy theory (Bandura et al., 1999), which argues that belief in one's skills and capabilities to attain desired results may boost the will to engage in achievement behaviors.

Contemporary theories view achievement motivation as a multidimensional construct. Example is Martin's integrative theory of motivation and engagement (Liem & Martin, 2012), which breaks achievement motivation into positive factors such as self-belief, planning, task management and persistence and negative factors such as anxiety, self-sabotage, and disengagement. Together the positive and negative factors create construct of achievement motivation. Of these factors at least self-belief contains self-evaluative element.

When individuals evaluate their abilities and chances of success, they are tapping into self-concept. Self-concept is defined as a container, which contains the evaluations of oneself, including characteristics, skills and roles. Through its contents, the self-concept contributes to individual's sense of identity and behaviors (American Psychological Association, 2022b).

Anxiety is defined as an emotion characterized by somatic symptoms of tension, which is caused by anticipation of danger, catastrophe or misfortune and accompanied by apprehensive behaviors. Somatic symptoms are related to the mobilization of body against perceived threats. These symptoms include muscle tension, fast breathing and rapid heartbeat. Anxiety consists of at least two dimensions: trait anxiety and state anxiety. Trait anxiety is defined as proneness to experiencing anxiety. Individuals high on trait anxiety are prone to viewing the world as threatening place and they respond to perceived environmental threats with changes in state anxiety. State anxiety is defined as dynamic state, which fluctuates in intensity and is a response to threatening situations (APA Dictionary of Psychology, 2022d).

Anxiety is known to affect the behavioral choices and motivations through factors such as previous conditioning (Pavlov, 1927), coping-expectancy (Carver & Scheier, 1988), threat evaluations (Eysenck, 1957) as well as attentional biases and speed of processing of threatening information (Massar et al., 2011).

**Analysis of past empirical studies on connection of Achievement motivation with Self-Esteem and Anxiety.** This section presents some of the prior findings about relationship of academic achievement motivation with self-esteem and anxiety. However, there are two issues that must be addressed before delving into the results of prior studies: (1) the unclear use of constructs of self-esteem and self-concept in research literature and (2) the difference between academic achievement motivation and actual academic achievement.

(1) Many authors seem to use concepts of academic self-esteem and academic self-concept interchangeably (Watkins & Dhawan, 1989; Huitt, 2004) and it is often difficult to state exactly, which one of the concepts is actually measured. For this reason not only studies using self-esteem will be presented, but also those which use concept of academic self-concept. The relationship between academic self-esteem and self-concept will also be discussed.

To clarify: self-esteem is considered to be only a part of self-concept (Rosenberg, 1965; APA Dictionary of Psychology, 2022b) and as such they are not completely the same construct. Some authors even argue that the correlations between these constructs are weak at best (Hansford and Hattie, 1982).

(2) There is lacking number of studies which measure the relationship of academic achievement motivation with self-esteem or anxiety. Instead, many studies measure actual academic achievement and not the achievement motivation. However, is has been demonstrated, that achievement motivation is positively connected with actual achievement (Robbins et al., 2004; Akbas & Adnan, 2007; Hustinx et al., 2009; Brjornebeck et al., 2013), for which reason these studies will be presented as well.

The results of prior studies appear to demonstrate few different and even contradictory connection types. Some studies suggest, that academic achievement motivation, academic achievement, academic self-concept and self-esteem are reciprocally connected (Trautwein et al, 2006; Di Giunta et al., 2013; Lawrence & Vimala, 2013). Others suggest, that this reciprocal relationship exists only between academic self-concept and achievement, but not with self-esteem (Marsh & O'Mara, 2008; Marsh & Martin, 2011). On the other hand, some studies have failed to find a connection between actual achievement with either academic self-concept or self-esteem (Tus, 2020).

Causality of these relationships partly remains an open question. Few suggestions state that academic self-concept predicts actual achievement (Awad, 2007; Fathi-Ashtiani, 2007) and that actual achievement predicts academic self-concept more strongly than the other way around (Chapman et al., 1990).

Actual achievement appears also to predict self-esteem but self-esteem does not appear to predict actual achievement (Gage & Berliner, 1992). On the other hand, some studies have found the opposite to be true with self-esteem predicting actual achievement (Fathi-Ashtiani, 2007) and achievement motivation (Di Giunta et al., 2013).

Academic achievement motivation has been shown to be positively connected with actual study achievement (Robbins et al., 2004; Akbas & Adnan, 2007; Hustinx et al., 2009; Brjornebeck et al., 2013). Academic achievement motivation also appears to have positive relationship with self-esteem (Fathi-Ashtiani, 2007; Nwankwo et al., 2013; Basco & Han, 2016; Topçu & Leana-Taşcılar, 2018; Olaoye, 2018).

For anxiety the relationships appear more clear. Anxiety seems to be negatively connected with both academic achievement motivation (Alpert & Haber, 1960; Mehrabian, 1994; Fathi-Ashtiani, 2007; Basco & Han, 2016) and actual academic achievement (Grooms & Endler, 1960; El-Anzi, 2005; Fathi-Ashtiani, 2007). However, there are suggestions that the level of students mediates this relationship, with weaker students showing negative connection between achievement and

anxiety, while in strongest students higher anxiety actual predicted better academic achievement (Spielberger, 1962).

All in all, this mishmash of results especially for academic achievement, self-esteem and academic self-concept suggests that relationships between these constructs are not simple and that situational and personality variables may affect the outcomes.

Method. Participants. Convenience sampling was used with 107 international students, 77 females and 30 males aged 19-55 (Mdn=25, M=28, SD=7,00) attending higher education facilities.

Measures. Rosenberg Self-Esteem Scale measures global self-esteem. Global Self-Esteem indicates the degree, to which the contents of individuals self-concept are positive. More positive contents lead to higher self-esteem.

State Self-Esteem Scale measures state self-esteem and it's 3 subscales of Performance, Social and Appearance self-esteem. State Self-Esteem indicates self-esteem which fluctuates over time and is sensitive to change of situation. Performance self-esteem indicates individual's feelings of one's own competency, belief in successful outcome of own actions and belief in one's ability to function in adequate manner. Social self-esteem indicates individual's feelings of one's own competency in social situations. Appearance self-esteem indicates individual's feelings and attitudes towards own physical body and appearance.

Beck Anxiety Inventory measures the amount of experienced anxiety symptoms during the last month. Anxiety refers to the symptoms associated with anxiety, such as lightheadedness, inability to relax, nervousness and similar symptoms.

State-Trait Anxiety Inventory contains two sub-inventories, one of which measures state anxiety and another which measures trait anxiety. State anxiety indicates anxiety, intensity of which fluctuates over time and is sensitive to situational change. Trait anxiety indicates proneness to experiencing anxiety. Individuals with high trait anxiety experience more fluctuations in state anxiety.

Motivation and Engagement scale is an integrative inventory, which measures factors, which are central to academic achievement motivation.

Positive motivation indicates energy and drive to learn, work effectively and achieve one's potential. It consists of three subscales: Self-belief, Valuing and Learning focus. Self-Belief indicates student's belief in one's own competency, skills and knowledge. Individuals with high self-belief trust in their ability to accomplish their work in sufficient manner. Valuing indicates how much the student values his or her education and how much he or she believes, that the skills and knowledge acquired during studies will be useful in other areas of life. Learning Focus indicates student's focus on learning achievements, like getting good grades. Individual with high learning focus is inclined to study hard.

Positive engagement indicates the behaviors, which follow from the positive motivation. Higher scores indicate higher positive engagement. It consists of three subscales: Planning, Task management and Persistence. Planning indicates student's ability and readiness to plan and organize his or her work. Individuals with high score in planning are skillful at coordinating their time and energy in advance. Task Management indicates student's ability to manage their time and energy while studying, choosing environments which enable their best potential or which let him or her stay as concentrated as possible. Persistence indicates student's ability to keep working at tasks even when they are difficult. Individuals who score high on persistence are inclined to keep working until the task has been completed.

Negative motivation indicates lack of energy and drive to learn, work effectively or achieve one's potential. It consists of three subscales: Anxiety, Failure avoidance and Uncertain control. Anxiety indicates student's inclination to feel anxiety when confronted with difficult tasks or possibility of failure. Failure Avoidance indicates student's inclination to avoid failures in different study context. Uncertain Control indicates student's feelings of uncertainty towards their ability to complete work in adequate manner.

Negative engagement indicates behaviors, which follow from negative motivation. It consists of two subscales: Self-sabotage and Disengagement. Self-Sabotage indicates behaviors, in which student causes his or her own failure, such as avoiding participating in schoolwork or not preparing for exams. Disengagement indicates student's lack of interest towards learning tasks or his or her studies in general.

**Results.** Effect sizes were defined as .10 small, .30 medium, .50 large (Ellis, 2010). Data was processed with SPSS 26 program and statistically significant results were found. Significant positive connection was found between Achievement motivation and aspects of State self-esteem. Global state self-esteem (rS = 0.71, p <.001), Performance state self-esteem (rS = 0.74, p <.001), Social state self-esteem (rS = 0.70, p <.001) and Appearance state self-esteem (rS = 0.41, p <.001) were all positively connected with achievement motivation.

Significant positive connection was found between Achievement motivation and aspects of State self-esteem. Global state self-esteem ($rS = 0.71$, $p <.001$), Performance state self-esteem ($rS = 0.74$, $p <.001$), Social state self-esteem ($rS = 0.70$, $p <.001$) and Appearance state self-esteem ($rS = 0.41$, $p <.001$) were all positively connected with achievement motivation.

Significant negative connection was found between Achievement motivation and aspects of Anxiety. General anxiety ($rS = -0.41$, $p <.001$), Trait anxiety ($r = -0.67$, $p <.001$) and State anxiety ($rS = -0.59$, $p <.001$) were all negatively connected with achievement motivation. Significant relationships were found between Global self-esteem and aspects of achievement motivation. Global self-esteem was positively connected with Self-belief, Valuing, Learning focus, Planning, Task management, Persistence and negatively connected to Anxiety, Failure avoidance, Uncertain control, Self-sabotage and Disengagement.
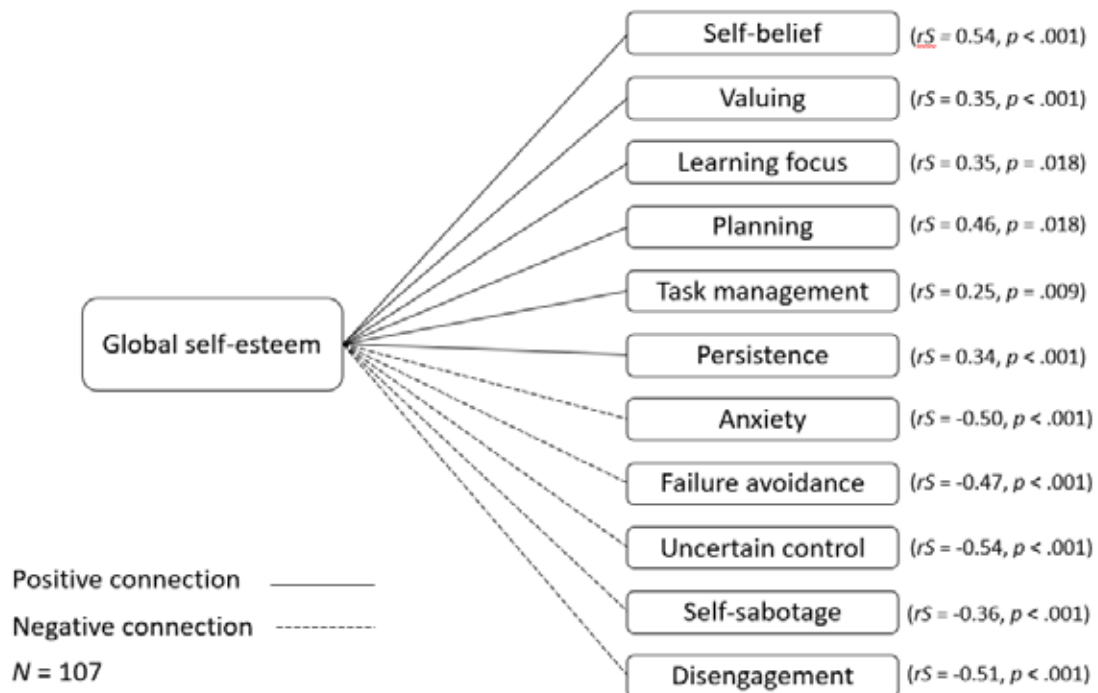


**Figure 1. Relationships between Global self-esteem and aspects
of Academic achievement motivation**

Significant relationships were found between aspects of State self-esteem and aspects of achievement motivation. State self-esteem was positively connected to Self-belief, Valuing, Planning, Task management and Persistence and negatively connected to Anxiety, Failure avoidance, Uncertain control, Self-sabotage and Disengagement.

**Figure 2. Relationships between State self-esteem and aspects
of Academic achievement motivation**

Performance state self-esteem was positively connected to Self-belief, Valuing, Learning focus, Planning, Task management and Persistence and negatively connected to Anxiety, Failure avoidance, Uncertain control, Self-sabotage and Disengagement.



**Figure 3. Relationships between Performance state self-esteem and aspects
of Academic achievement motivation**

Social state self-esteem was positively connected to Self-belief, Valuing, Planning, Task management and Persistence and negatively connected to Anxiety, Failure avoidance, Uncertain control, Self-sabotage and Disengagement.
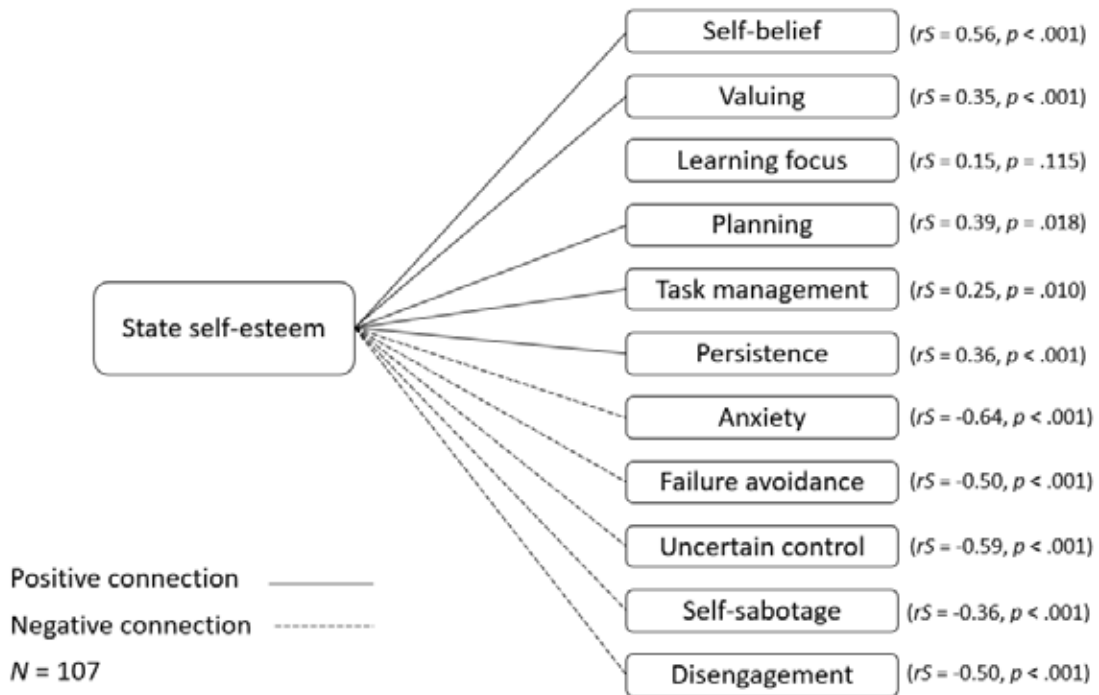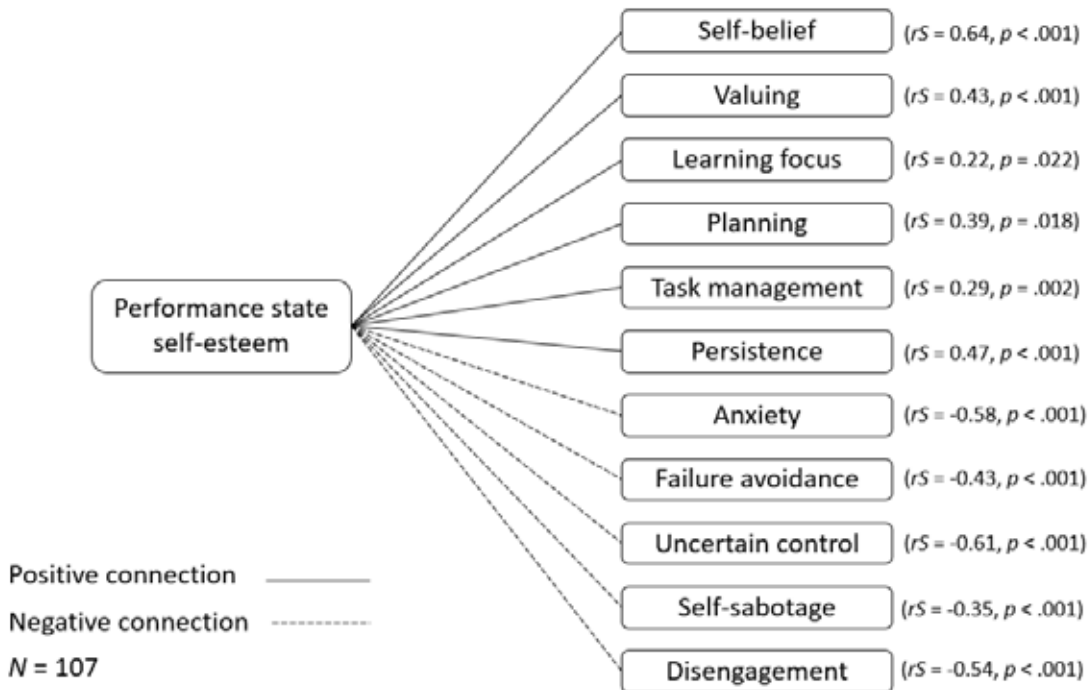


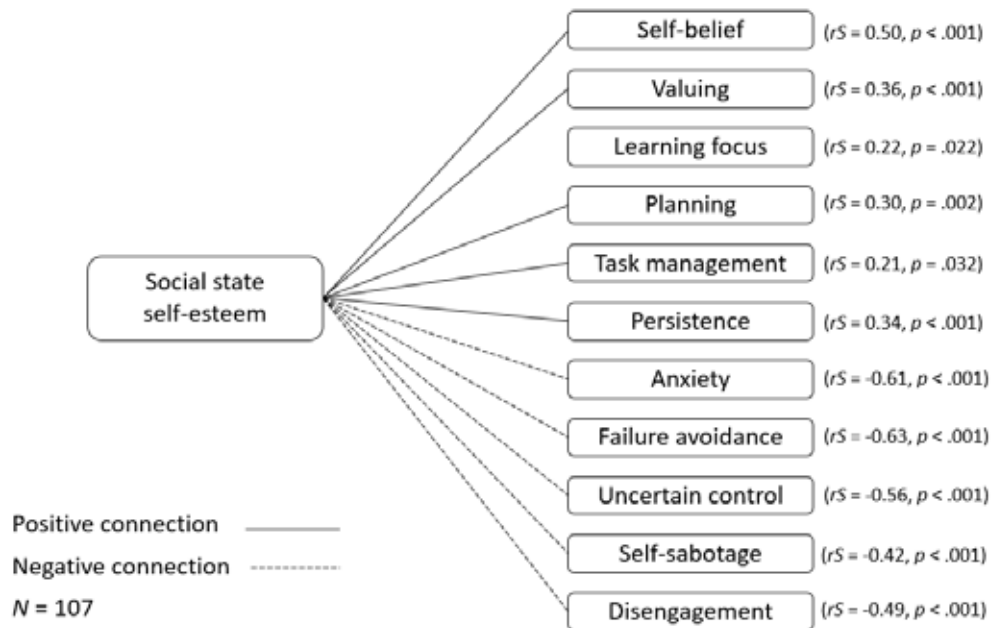**Figure 4. Relationships between Social state self-esteem and aspects of Academic achievement motivation**

Appearance state self-esteem was positively connected to Self-belief and Planning and negatively connected to Anxiety, Failure avoidance, Uncertain control and Disengagement.
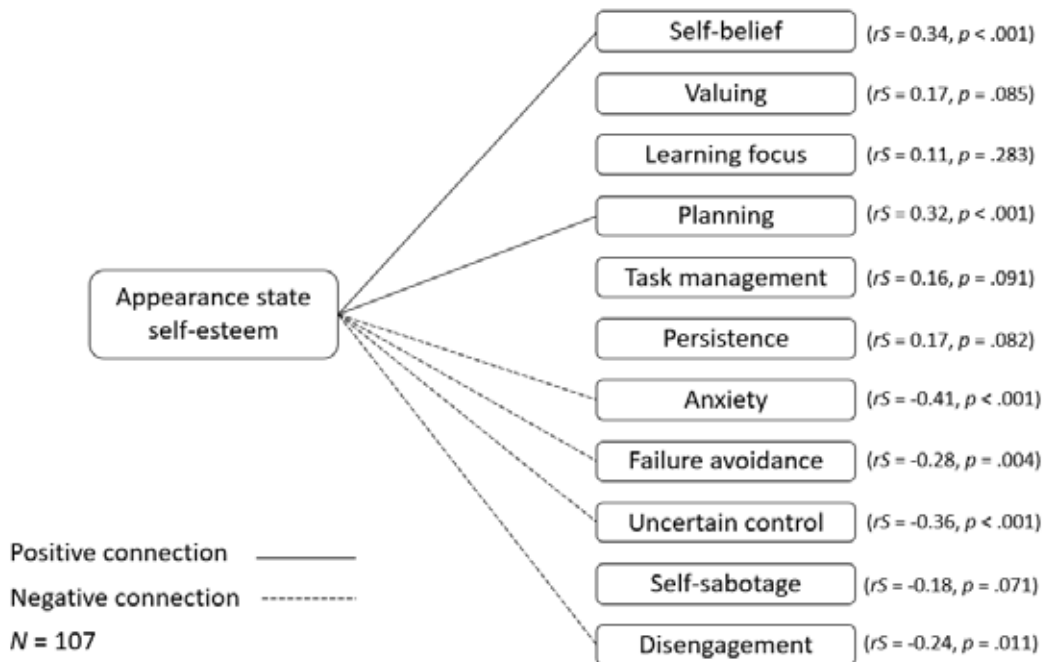


**Figure 5. Relationships between Appearance state self-esteem and aspects of Academic achievement motivation**

Significant relationships were found between aspects of Anxiety and aspects of achievement motivation. General anxiety was negatively connected to Self-belief, and positively connected to Anxiety, Failure avoidance, Uncertain control, Self-sabotage and Disengagement.
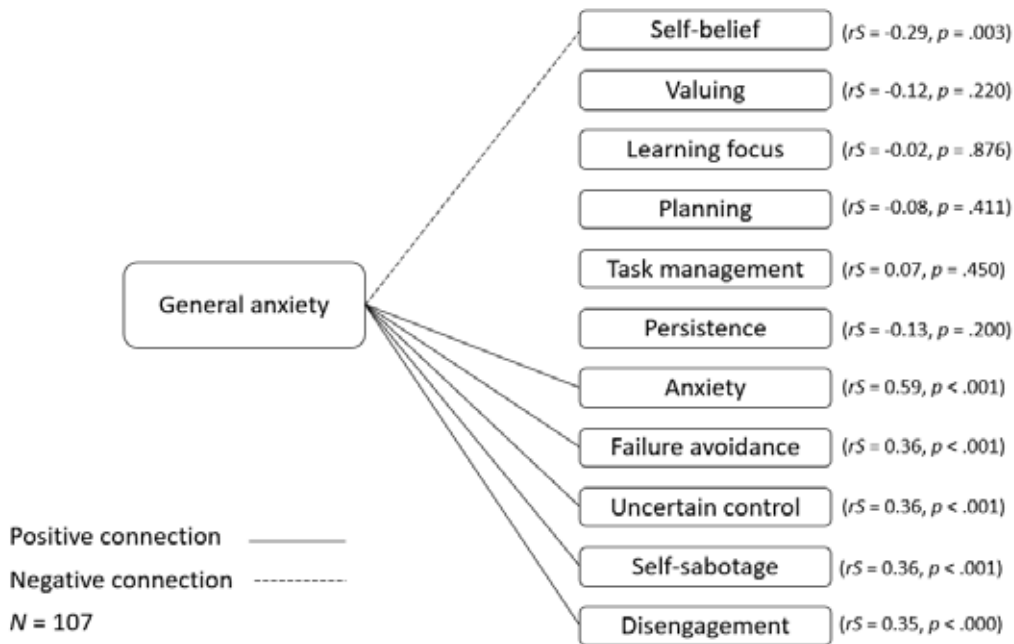


**Figure 6. Relationships between General anxiety and aspects
of Academic achievement motivation**

Trait anxiety was negatively connected to Self-belief, Valuing, Planning and Persistence and positively connected to Anxiety, Failure avoidance, Uncertain control, Self-sabotage and Disengagement.



**Figure 7. Relationships between Trait anxiety and aspects
of Academic achievement motivation**

State anxiety was negatively connected to Self-belief, Valuing, Planning and Persistence and positively connected to Anxiety, Failure avoidance, Uncertain control, Self-sabotage and Disengagement.
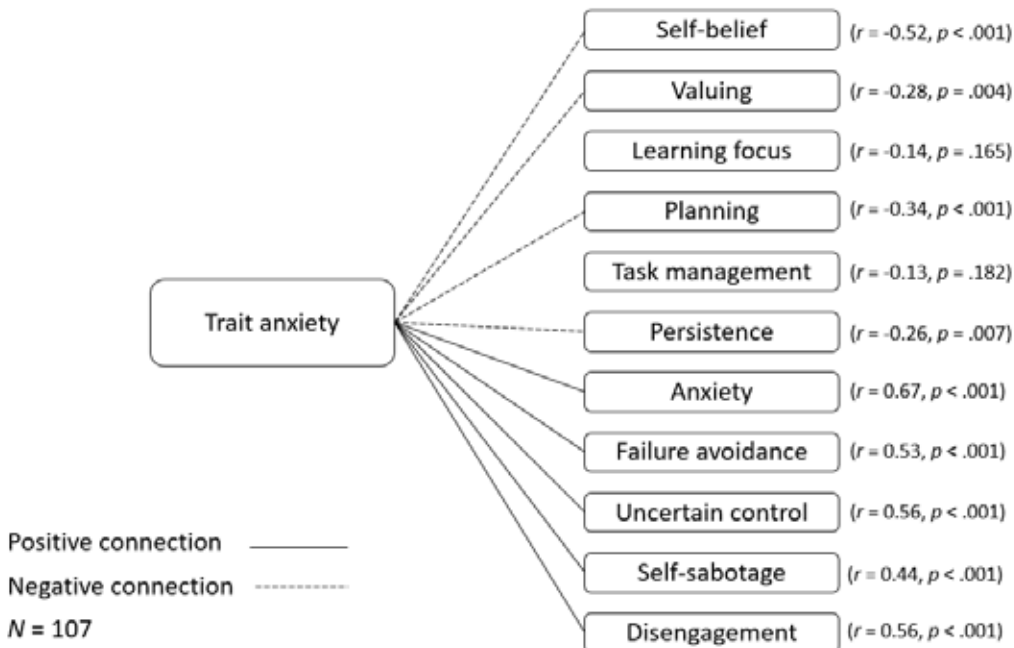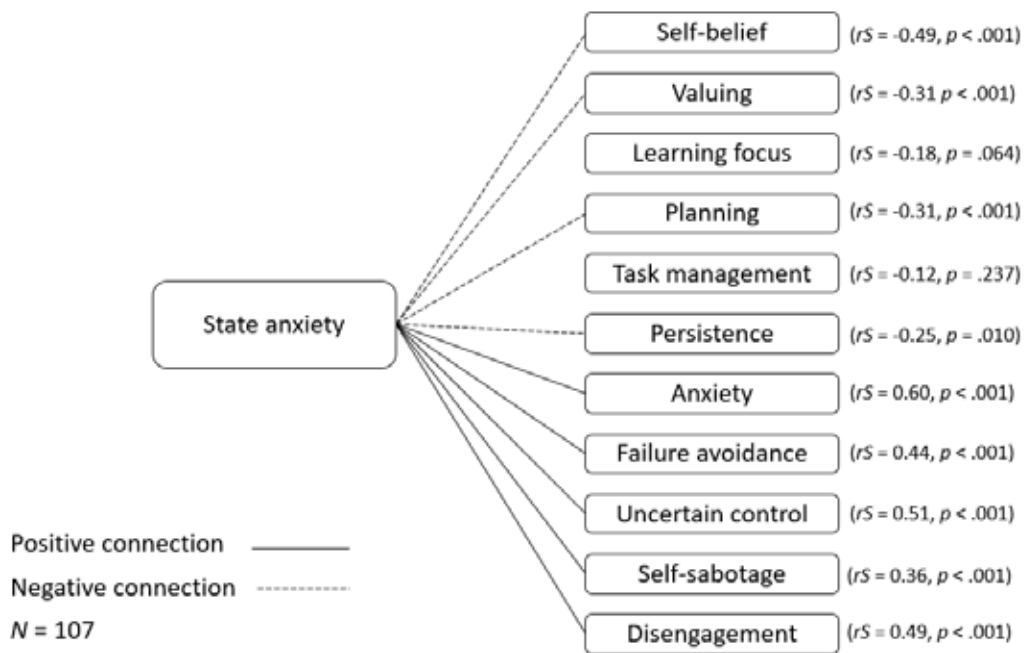


| | |
| State anxiety | Self-belief — $(rS = -0.49, p < .001)$ |
| | Valuing — $(rS = -0.31\ p < .001)$ |
| | Learning focus — $(rS = -0.18, p = .064)$ |
| | Planning — $(rS = -0.31, p < .001)$ |
| | Task management — $(rS = -0.12, p = .237)$ |
| | Persistence — $(rS = -0.25, p = .010)$ |
| | Anxiety — $(rS = 0.60, p < .001)$ |
| | Failure avoidance — $(rS = 0.44, p < .001)$ |
| | Uncertain control — $(rS = 0.51, p < .001)$ |
| | Self-sabotage — $(rS = 0.36, p < .001)$ |
| | Disengagement — $(rS = 0.49, p < .001)$ |

Positive connection ————
Negative connection - - - - - - -
$N = 107$

**Figure 8. Relationships between State anxiety and aspects
of Academic achievement motivation**

**Discussion.** The results demonstrated that both Global and State aspects of self-esteem was connected with academic achievement motivation (AAM) in a positive manner. This coincides with results from previous research (Fathi-Ashtiani, 2007; Nwankwo et al., 2013; Basco & Han, 2016; Bhatt & Bahadur, 2018; Olaoye, 2018).

Global, state and performance self-esteem were positively connected with every positive aspect of AAM (self-belief, valuing, learning focus, planning, task management and persistence) and negatively connected with every negative dimension (anxiety, failure avoidance, uncertain control, self-sabotage and disengagement). This means, that when self-esteem increases, the positive aspects of academic achievement motivation increase and vice versa.

Few possible explanations for these connections follow. Positive self-evaluation is known to be a predictor for self-esteem (Brown et al., 2001). This would explain the positive relation with Self-belief aspect of AAM. Positive evaluations about one's abilities may also explain the connection with Learning focus, Planning, Task management and Persistence through expectancy-value theory (Wigfield & Eccles, 2000), as the individual, who believes in his or her ability to achieve desired outcomes may be more likely to engage in tasks, which lead to the desired outcome (McClelland, 1961). Inversely, the same may explain the negative connection with Failure avoidance, Uncertain control and Disengagement aspects of AAM, as the individual who does not believe in one's abilities and thus views failure as likely outcome may be prone to avoiding study-related tasks or to feeling disinterested towards them.

The connection between self-esteem and self-sabotage may be explained by attribution theory (Weiner, 1974). When the individual knows, that the failure at task is result of their own self-sabotaging behaviors, it may affect their self-evaluations less negatively than in a situation, in which individual fails despite their best efforts. In other words, it is easier to accept self-caused failure than attribute the failure to lack of skills or other negative characteristics, as the latter may lead to higher self-threat.

In this way, self-sabotaging behaviors may be viewed as an attempt to create opportunity structures mentioned by Cast & Burke (2002), which are created to protect the individual's self-esteem.

Connection between self-esteem and Valuing may be explained from the perspective of sociocultural theories of self-esteem. In a culture, which values education and academic success, the individual may be prone to valuing these highly, because the surrounding culture does so as well (Harmon-Jones et al., 1997). Additionally, as valuing of education boosts motivation to complete one's studies in successful manner (Liem & Martin, 2012), then putting in effort may be seen as an attempt to create an opportunity structure (Cast & Burke, 2002), which would boost individual's self-esteem in the long run. Thus, the connection with Valuing may result from a strategy to keep one's self-evaluations positive, as failure would possibly result in individual's self-evaluations turning negative, leading to increased self-threat (Cast & Burke, 2002).

As for the connection between self-esteem and Anxiety aspect of AAM, the explanation seems straightforward. Self-esteem is known to be negatively connected to anxiety in students (Fathi-Ashtiani, 2007; Basco & Han, 2016) and the same effect is observed here as well.

It was found, that every investigated aspect of anxiety was negatively connected with AAM. This means, that when anxiety increases, AAM decreases and vice versa. This coincides with the previous research on the same topic (Mehrabian, 1994; Fathi-Ashtiani, 2007; Basco & Han, 2016). General anxiety was negatively connected with Self-belief aspect of academic achievement motivation and positively connected with all aspects of negative motivation and engagement. Negative connection with self-belief and positive connection with Uncertain control may be explained by cognitive-evaluative element in anxiety (Eyesenck, 2000). Individuals, who have low belief in their abilities are more prone to evaluate situations as too difficult or too threatening, elevating their anxiety levels. The same may explain the connection with Failure avoidance, as individuals with low belief in their abilities may be more prone to avoiding situations, which may result in failure, as the failure seems more likely when individuals perceive their abilities as lacking (McClelland, 1961; Wigfield & Eccles, 2000).

Connection with failure avoidance may also be partly explained by individual anxiety sensitivity (Eysenck, 1957), as persons who are more sensitive to experiencing anxiety may more likely choose to avoid situations, which may result in failure as to avoid experiencing the resulting anxiety. Another similar explanation may be found in attentional bias (Eysenck, 1957), as individuals high on attentional bias may be more effective in identifying threatening situations and then choosing to avoid them.

Connection of anxiety with Self-sabotage may be explained by the attribution theory (Weiner, 1974) and the need to protect one's self-worth (Want & Kleitman, 2006). When an individual attributes their failure to self-sabotaging behaviors, their self-worth is better protected than when the failure ensues despite the individual trying hard to achieve success.

Connection of anxiety with Disengagement may be explained through the factor of enjoyment. When individuals enjoy what they are doing, they are more likely to keep engaging with that task. Because anxiety reduces enjoyment, it also increases disengagement (Martin et al., 2012). Same may apply inversely to the negative connection between anxiety and Persistence, as the individuals who do not enjoy their task are less likely to persist in doing them.

The limitations of the study include its purely correlational nature. Full sample was also processed without dividing it into groups such as by gender, age or student level (high versus low achievers). Future research should address this, as different groups may exhibit different connections.

**Conclusions.** It was found that global and state self-esteem were positively connected with academic achievement motivation. This means, that when self-esteem increases, academic achievement motivation increases and vice versa. It was also found, that general, trait and state anxiety were negatively connected with academic achievement motivation. This means, that when anxiety increases,

academic achievement motivation decreases and vice versa. For subscales of academic achievement motivation, it was found that both global and state self-esteem were positively connected to every positive subscale of academic achievement motivation and negatively connected to its every negative subscale. This suggests that students with higher self-esteem have higher self-belief, value their studies more, are more focused on learning, engage in more planning behaviours, are better at task management and are more persistent. They are also less anxious, failure avoidant and experience less uncertain control. They engage in less self-sabotaging behaviours and are more engaged than students with low self-esteem.

It was also found that both trait and state anxiety were negatively connected to every positive subscale of academic achievement motivation and positively connected to every negative subscale of academic achievement motivation. This suggests that students with higher anxiety have less self-belief, value their studies less, engage in less planning behaviours and are less persistent. They are more anxious, failure avoidant and experience more uncertain control. They engage in more self-sabotaging behaviors and are less engaged than students with low anxiety.

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# EXPLICIT AND IMPLICIT ATTITUDES TOWARDS HARDINESS IN VARIOUS OCCUPATIONAL GROUPS

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**Abstract.** The aim of the research was to identify the features of explicit and implicit assessments of hardiness and its components obtained for participants whose occupations are associated with risk: security guards, long-distance lorry drivers, footballers from one of the top football league teams; participants with occupations associated with unconditional execution of orders. Measurements were made using specially designed four modifications of the classical IAT and the self-report procedure Bartone's Dispositional Resilience Scale. The study showed that there are differences in implicit and explicit attitudes towards hardiness and its components in groups of participants from different occupations: most guards and long-distance lorry drivers revealed a negative implicit challenge; the majority of 'soldiers' were found to have negative attitudes towards the commitment. The vast majority of long-distance lorry drivers showed matches of the measurements results. The independence of implicit and explicit 'overall' attitudes toward hardiness, and their content, is also shown.
**Key words:** Hardiness, Commitment, Control, Challenge, Implicit measures, Implicit Associative Test (IAT).

The concept of attitude is one of the central concepts in psychology, as it is associated with human behaviour. The essence of an attitude is that it characterises an individual's attitude to a certain object, based on his/her assessments. Since the mid-1990s, research on attitudes has been shaped by a dualism that has gained enormous popularity across all areas of psychology: the implicit-explicit dualism (s. Gawronski & Payne, 2010), which has its roots in the development of a new class of indirect measurement instruments, distinct from direct measurement instruments based on self-report. A central feature of these instruments is that they rely on experimental procedures adapted from cognitive psychology. They are known as implicit measures, whereas self-reported measures are called explicit ones. A key feature of implicit measures applied to the study of attitudes is that evaluative responses are inferred from objective performance indicators, such as participants' speed and accuracy in responding to attitudinal stimuli (Gawronski et al., 2020).

Implicit attitudes are mainly the result of associative processes. Explicit attitudes are mainly the result of propositional processes. Explicit measurements are direct, controlled, and conscious. They measure the conscious assessments that come to subjects' minds after some deliberation (Petty, Fazio & Briñol, 2009). They are direct, since the participant is aware of what is being measured. They are based on explicit knowledge of oneself and allow to adequately measure the true attitude to the extent that the individual is aware of it and that he/she is ready to publicly express his/her attitude. Advances in social cognition have made it possible to study many psychological constructs not only on a controlled, but also on an automatic level. Implicit measurements, which are indirect, automatic, and unconscious, are associated with a more effective assessment of attitudes since they do not involve deliberate assessments or strategic manipulation (e.g., socially desirable judgment). Implicit measurements are based on measuring the reaction time (RT) of the participants performing various tasks and their attention being focused on the task completion, and not on the object of attitude (Rudman, 2011).

**Implicit Association Test (IAT).** One of the main implicit procedures is the classical IAT (Greenwald, McGhee, & Schwartz, 1998), an experimental procedure based on measuring the strength and speed of actualisation of automatic associations between individual representations of a person. It is a tool that measures the relative relationships between pairs of concepts called categories and attributes. During the performance of the IAT, participants randomly classify categories and attributes in a certain way. The IAT main hypothesis is that participants' responses will be faster and more accurate if specific attributes and categories are associated with stronger associations than if the association between them is weaker.

The combined use of implicit and explicit measures not only provides additional information about the adequacy of measurements, but also gives a deeper understanding of the construct being studied (Rudman, 2013).

**Hardiness and Resilience**

**Resilience** is the ability to recover from adversity without the experience of significant distress, effective coping and adaptation in managing personal hardship combined with a sense of purpose in daily life and of personal control over what occurs in one's life.

**Hardiness** is a personality variable that promotes resiliency (Bartone et al., 2008. Maddi, 2007). Hardiness is a set of attitudes, or disposition that motivates an individual to the kind of positive action that aids in converting personal tragedy into a growth experience (Maddi, 2002). Hardiness dampens the effects of a stressful situation through information gathering, decisive actions, and learning from the experience (APA Dictionary of Psychology, 2009).

Hardiness is regarded as a pattern of attitudes, skills, and abilities which constitutes courage (Maddi, 2013), the ability not to lose health and self-possession under pressure of stressful situations.

In 1979, Sofia Kobasa noticed that people who experience high degrees of stress without falling ill have a personality differentiating them from those who become sick under stress. This personality difference is characterised by the term hardiness. She formulated three hypotheses about control, commitment and challenge that help to cope with stress. Resilience is the capability to adapt to threatening situations without experiencing considerable stress. Hardiness denotes personality traits that moderate perception of stressful factors.

The components of hardiness are Commitment, Control, and Challenge a.k.a. 3Cs.

*Commitment* is an important personality characteristic. It is formed in the process of the person's interaction with the environment. It motivates a person to self-realization, leadership, healthy way of thinking and behaviour. It enables a person to feel significant and valuable enough to be fully involved in solving life problems despite the presence of stressful situations (Maddi, 2013).

*Control* is expressed in the ability to lead the actions and events of what is happening. It is manifested in the search for active ways of influencing the effects of stress, as opposed to helplessness and passivity. It motivates a person to turn all stress from potential disasters into opportunities for personal growth. It is the desire for action and struggle that allows us to influence the result of what is happening, despite the fact that this influence may not be absolute and success is not guaranteed (Maddi, 2013).

*Challenge* determines openness and susceptibility to changes in a person's life, which are viewed as new opportunities (opposite to the fear of change). If a person is able to perceive life situations as a challenge, then he achieves a sense of satisfaction by using stress as an opportunity for development. Such people believe that you can learn from both mistakes and achievements (Maddi, 2013).

Existential psychologists believe that "choose the future" regularly requires courage. Without courage, one may "choose the past" regularly, which stagnates the quest for meaning. Hardiness, comprised of the attitudes of commitment (vs. alienation), control (vs. powerlessness), and challenge (vs. security) is offered as an operationalisation of existential courage (Maddi, 2004).

The studies of hardiness for different occupations have their own features. The present investigation is based on the analysis and generalisation of the studies presented and published by Irina Plotka

and colleagues (2013, 2015, 2017), Shaplavska and Plotka (2014). **The aim of the research** was to identify the features of explicit and implicit assessments of hardiness and its components obtained for research participants whose occupations are associated with risk: for occupations associated with unconditional execution of orders, for security guards, for long-distance lorry drivers, for professional footballers.

**Research questions**

1. Are there differences in implicit and explicit hardiness and its components among research participants, depending on their occupational group?

2. Is there an implicit-explicit correspondence between the results of measurements of hardiness and its components using the appropriate IAT experimental procedures and self-reporting procedures?

3. What are the common factors underlying the relationship between implicit and explicit hardiness and its components?

**Method**

**Participants –** 214.

(1) 74 of them were aged 21 – 50 years old (*Mdn* = 29) with profession associated with risk and with the unconditional execution of orders ("soldiers");

(2) 75 of them were aged 22 – 64 years old (*Mdn* = 45) security guards whose work presupposes the presence of stressful situations, and, accordingly, personal qualities that help withstand stress. Working as a security guard implies the ability to use physical strength and aggression.

(3) 40 of them were aged 26 – 55 years old (*Mdn* = 38) long-distance lorry drivers;

(4) 25 professional footballers from a top football league team, aged 19 – 25 years old (*Mdn* = 21).

**Implicit measures:** the experimental procedures based on the classical IAT methodology (Greenwald, McGhee, & Schwartz, 1998) and modified IAT (Šaplavska & Plotka, 2014): IAT1 – Commitment, IAT2 – Control, IAT3 – Challenge, IAT4 – Hardiness. IAT experimental procedures measure the effect of hidden, implicit associations of verbal stimuli, i.e. categories, reflecting the content of the hardiness construct and its components with attributes of positive or negative valence.

**The categories** are the verbal stimuli. This is a set of behavioral characteristics determined by personality traits, intentional and motivational characteristics of an individual and semantically related to hardiness and its components. The stimuli were selected in accordance with the theoretical approaches of S. Maddi and P. Bartone and the content of the DRS-15 methodology.

*IAT 1 Commitment*: Isolation, Commitment, Detachment, Meaningfulness, Meaninglessness, Involvement, Monotonous life, Content life, Boredom, Concern.

*IAT 2 Control*: Wait, Act, Cede, Overcome, Weaken, Manage, Drift, Influence, Depend on circumstances, Define.

*IAT 3 Challenge*: Stability, Dinamicity, Consistency, Changes, Reliability, Risk, Safety, Unctrtainty, Commonplaceness, Search.

*IAT 4 Hardiness*: Senselessness, Meaningfulness, Lack of initiative, Overcoming, Safety, Risk, Passivity, Resilience, Avoidance, Vigorousness.

**The attributes** are verbal stimuli: the words with a strong positive or negative affective meaning (Schlossberg, 1952). Positive valence: "Love, joy, peace, happiness, luck". Negative valence: "Hatred, disgust, contempt, evil, anger".

**Apparatus:** E-Prime 2®.

**Explicit measure:** "Dispositional Resilience Scale, DRS-15" consists of 15 items, including 3 subscales (commitment, control, and challenge) of 5 statements each. The statements were rated on a 4-point Likert scale: "Not true at all" (0); "Somewhat true" (1); "Fairly true" (2); "Completely true" (3).

*Commitment* determines how actively a person is involved in life (as opposed to non-involvement), and allows a person to feel important and valuable enough to be fully involved in solving life problems, despite the presence of stressful situations. "*Most of my life gets spent doing things that are meaning-*

*ful. \*I feel that my life is somewhat devoid of meaning. I really look forward to my daily activities. Most days, life is really interesting and exciting for me. \*Life in general is boring for me*" (Bartone, 1995).

**Control** determines the degree to which a person can influence what is happening as opposed to feeling helpless). "*By working hard, you can nearly always achieve your goals. \*I don't think there is much I can do to influence my own future. How things go in my life depends on my own actions. It is up to me to decide how the rest of my life will be. My choices make a real difference in how things turn out in the end*"(Bartone, 1995).

**Challenge** defines openness and sensitivity to life changes, which are seen as opportunities for personal growth (as opposed to fear of change). "*\*I don't like to make changes to my regular activities. Changes in routine are interesting to me. I enjoy the challenge when I have to do more than one thing at a time. \*It bothers me when my daily routine gets interrupted. \*I like having a daily schedule that doesn't change very much*" (Bartone, 1995).

The reverse statements are marked with asterisks*.

The **hardiness** is defined as the sum of scores on three subscales.

Higher scores correspond to more pronounced hardiness, commitment, control and challenge, respectively.

In all previous studies, Cronbach's alpha was at least.70.

**Methodological balance of implicit and explicit procedures**

The main principle behind the creation of measuring implicit and explicit procedures was their methodological balance, which was achieved by selecting verbal stimuli in the IAT procedure that were identical to those presented in the DRS-15 subscales.

**Results**

**Variables.** To define the effect of implicit associations in all our studies of hardiness, D-scores were used. According to the accepted international classification, the effect exists when

– $D \geq 0.15$, i.e. the implicit associations with Hardiness (Commitment, Control, Challenge) category together with positive attributes or the one opposed to it vs Hardiness (vs Commitment, vs Control, vs Challenge) category together with negative attributes are more stronger.

– $D \leq -0.15$, i.e. the implicit associations with Hardiness (Commitment, Control, Challenge) category together with negative attributes or the one opposed to it vs Hardiness (vs Commitment, vs Control, vs Challenge) category together with positive attributes are more stronger;

– $-0.15 < D < 0.15$ – no effect found. In this case, two situations are possible: (1) ambivalence of associations; (2) very weak associations (Rudman, 2011).

In this research, the *D-scores* are: *Hardiness D(IAT), Control D(IAT), Commitment D(IAT), and Challenge D(IAT)*.

The explicit variables according to DRS-15:
– *Hardiness (Bartone), $Q_1 = 25.0$, $Q_3 = 38.0$.*
– *Control (Bartone), $Q_1 = 9.00$, $Q_3 = 13.25$;*
– *Commitment (Bartone), $Q_1 = 8.00$, $Q_3 = 11.0$;*
– *Challenge (Bartone), $Q_1 = 7.00$, $Q_3 = 11.0$.*

The quartiles of the combined group were used to divide the scores into high, low and medium.

**Research Question 1.** Frequency analysis – the Fisher's angular transformation test was used to answer the first research question (Figures 1-5). There are some relevant facts to note.

**"Soldiers".** The data were obtained on a sample of people whose occupation is related to risk, the specific activity of whom involves strict adherence to orders. The manifestation of commitment in their activities is strictly regulated, limiting the possibility of leadership, awareness of self-worth and value, and the possibility of full integration into the solution of life tasks.

59% of the participants showed negative implicit commitment, i.e. alienation according to Muddi (2004). 19% of the participants showed implicit effect and 22% did not reveal any implicit effect,

which is statistically significantly less than 59%: φ* = 4.83, *p* <.001, effect size Cohen's *h* = 0.79 is almost large.

At the explicit level, only 8% of the participants are aware of this. 65% of participants showed an average level of commitment, which is statistically significantly higher than the percentage of participants (27%) with a high level of engagement: φ* = 4.74, p <.001, effect size Cohen's *h* = 0.78 is almost large.

**Guards.** 53% of the participants showed negative implicit challenge, i.e. security according to Maddi (2004). 24% of the participants showed positive and 23% did not reveal any implicit effect, which is statistically significantly less than 53%: φ* = 3.76, p <.001, effect size Cohen's *h* = 0.61 is medium.

At the explicit level, only 56% of the participants are aware of this. 40% showed an average level of challenge, which is statistically significantly less than 56% of the participants with a high level of commitment: φ* = 1.97, p =.049, effect size Cohen's *h* = 0.30 is small.

**Drivers.** 57% of the participants showed negative implicit challenge or security. 20% of the participants showed positive and 23% did not reveal any implicit effect, which is statistically significantly less than 57%: φ* = 4.14, p <.001, effect size Cohen's *h* = 0.90 is large.

At the explicit level, only 3% of the participants might be aware of this fact. 15% of the participants revealed a medium level of challenge, which is statistically significantly less than 83% of the participants with a high level of challenge: φ* = 6.63, p <.001, effect size Cohen's *h* = 1.48 is large.

In Figure 1, the distributions of participants from different occupational groups according to the levels of implicit and explicit attitudes are shown.
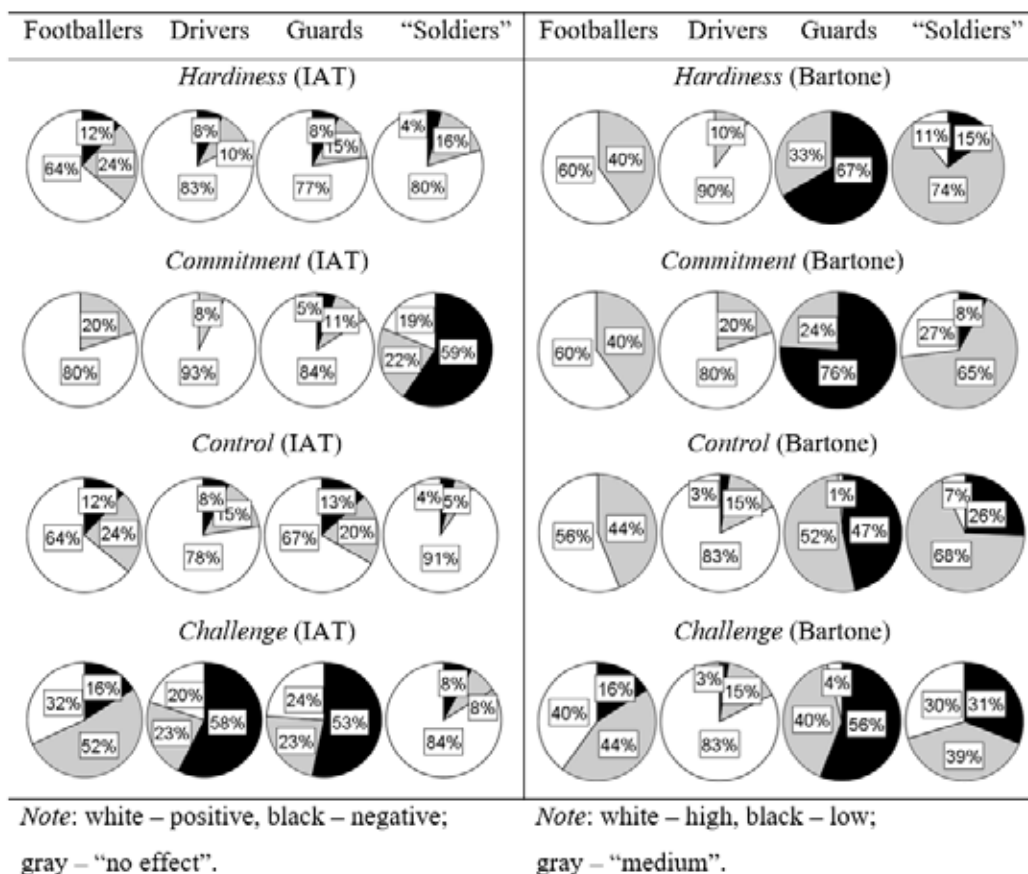


*Note*: white – positive, black – negative; gray – "no effect".

*Note*: white – high, black – low; gray – "medium".

**Figure 1. Distribution of Participants from Different Occupational Groups According to the Levels of Implicit and Explicit Attitudes**

Figures 2-5 show 'portraits' of the participants from different occupational groups according to their implicit and explicit resilience and its components. The scores for the explicit variables were multiplied by certain coefficients to make the images clear.
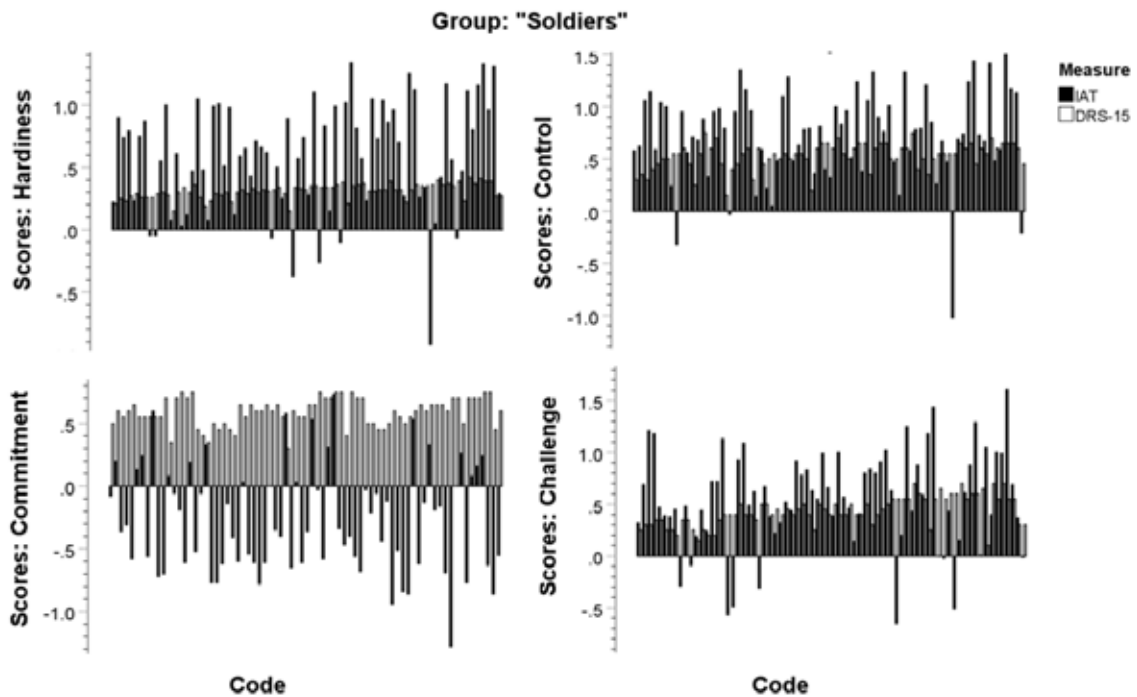


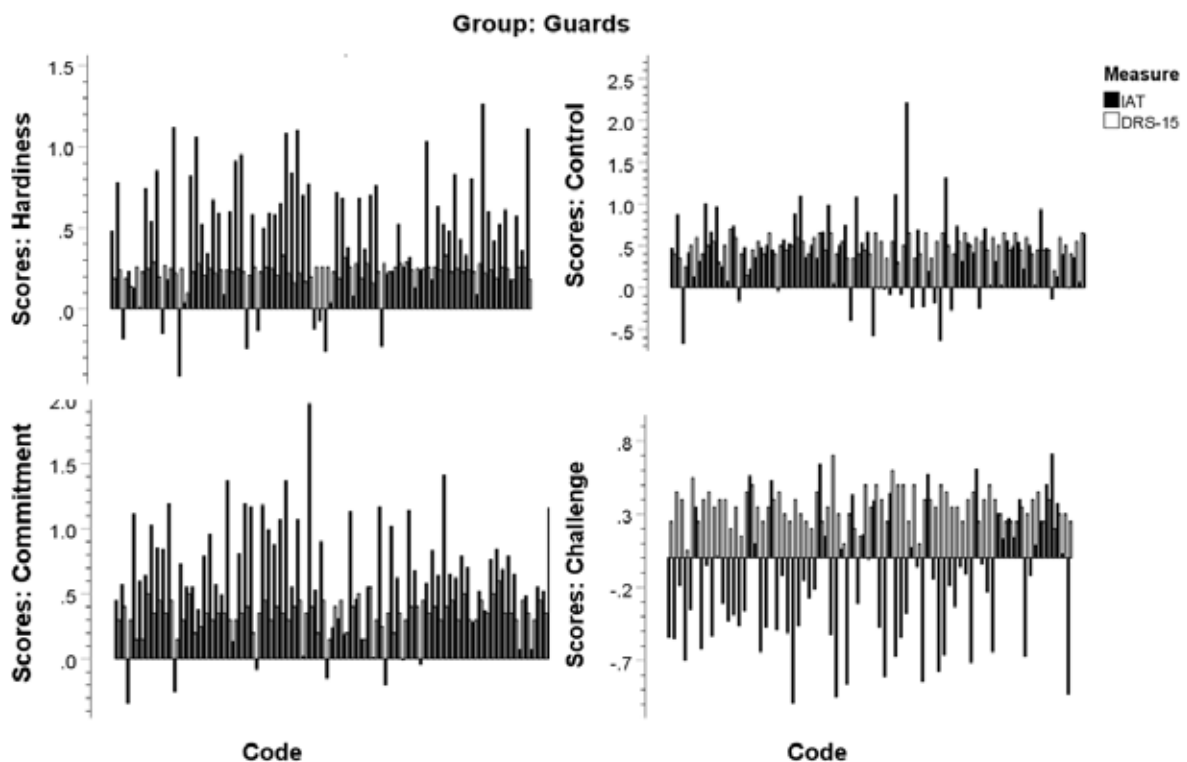**Figure 2. Implicit and Explicit Hardiness: "Soldiers"**



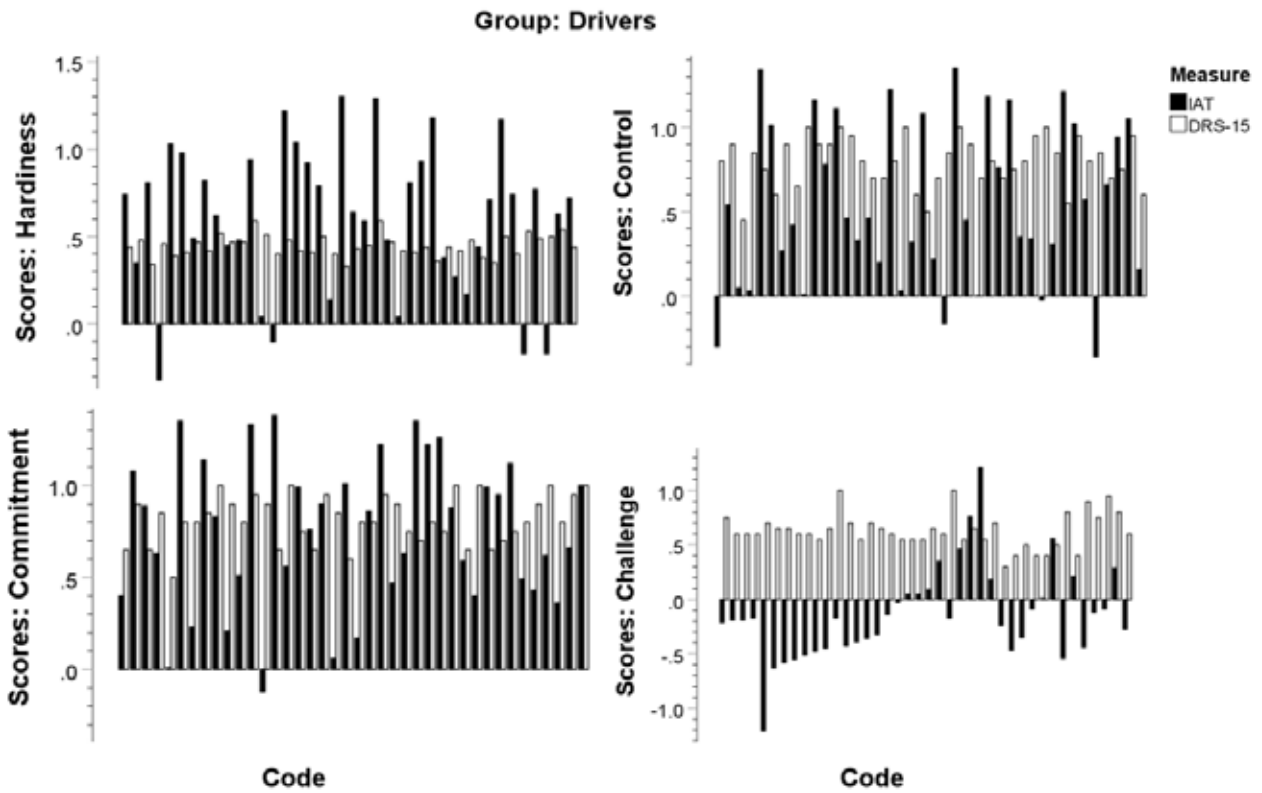**Figure 3. Implicit and Explicit Hardiness: Guards**

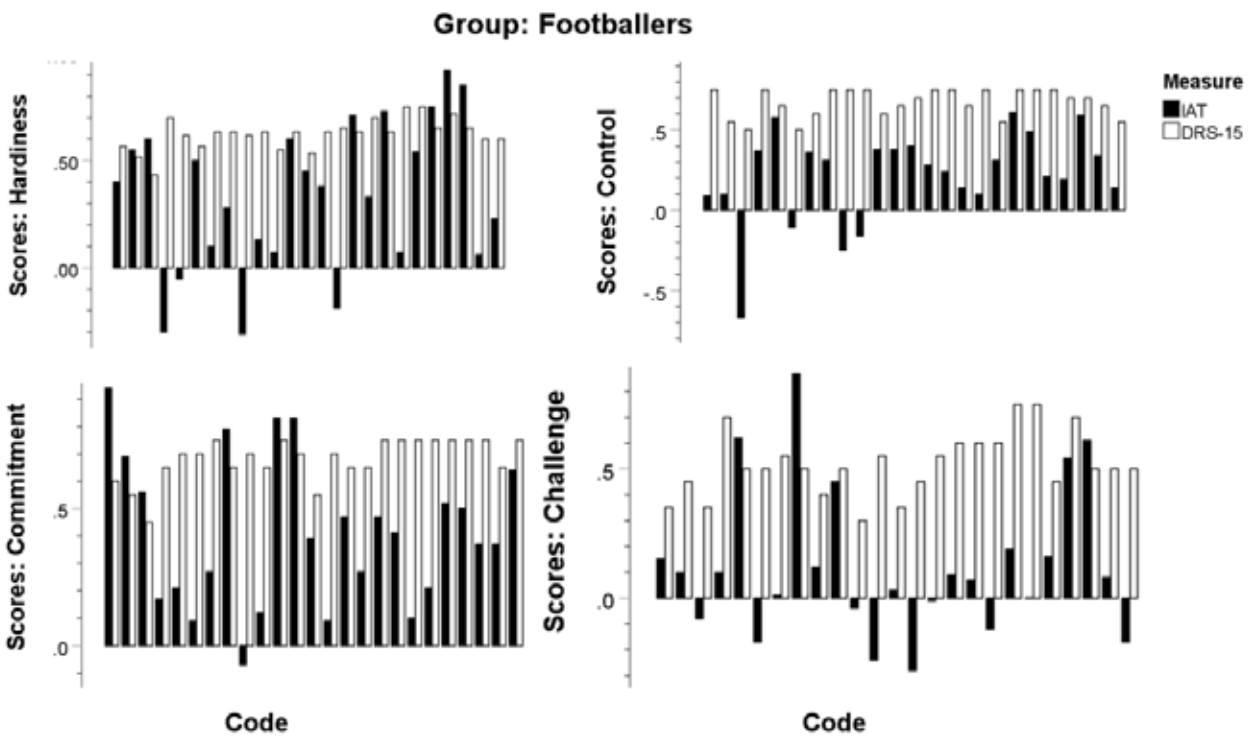**Figure 4. Implicit and Explicit Hardiness: Drivers**



**Figure 5. Implicit and Explicit Hardiness: Footballers**

**Research Question 2.** Implicit-explicit correspondence between the results of hardiness and 3Cs measurements using the respective experimental IAT and self-report procedures was established using Pearson and Spearman correlation coefficients (Table 1). The number of matches of the implicit-explicit results of the measurement was also calculated (Table 2).

Table 1

**Implicit-Explicit Correspondence between the Results of Measurements: Correlations**

| Group | Variables $D(IAT)$- Bartone | Correlation Coefficient | Correspondence | Effect size |
|---|---|---|---|---|
| "Soldiers" | All variables | | Uncertain consistency | |
| Guards | *Hardiness* | $r_S(75) = -.25*, p = .035$ | Inconsistency | Near to medium |
| | *Commitment* | $r_S(75) = .17, p = .14$, ns | Consistency | low |
| Drivers | *Hardiness* | $r_S(40) = -.17, p = .29$, ns | Inconsistency | low |
| | *Challenge* | $r_S(40) = -.20, p = .21$, ns | Inconsistency | low-medium |
| Footballers | *Control* | $r(25) = .32, p = .12$, ns | Consistency | medium |
| | *Commitment* | $r(25) = -.21, p = .32$, ns | Inconsistency | low-medium |

Table 2

**Implicit-Explicit Correspondence between the Results of Measurements: Percentages of Matches**

| Group | *Hardiness* | *Control* | *Commitment* | *Challenge* |
|---|---|---|---|---|
| "Soldiers" | 16% | 12% | 23% | 26% |
| Guards | 11% | 19% | 8% | 37% |
| Drivers | 73% | 63% | 78% | 23% |
| Footballers | 52% | 56% | 48% | 20% |

The maximum percentage of matches – 78% – is observed for commitment in the group of Drivers. It is statistically significantly higher than the percentage of mismatches 22%: $\varphi* = 4.31$, p <.001, effect size Cohen's $h = 0.96$ is large.

**Research Question 3.** To understand what the common factors underlying the relationship between implicit and explicit hardiness and its components are, the factor analysis for each occupational group was done: two factors (Kaiser criterion), Principal Component Method, Rotation's method Varimax with Kaiser Normalisation, Rotation converged in 3 iterations, Scores based on method "Regression" (s. Tables 3-4, Figure 6). Cumulative percent for two factors of total variance explained are: for 'soldiers' 62.95% = 35.29% + 27.66%; for guards 51.92% = 26.38% + 25.54%; for drivers 54.69% = 31.47% + 23.22%.

Due to the insufficient number of observations for the group of football players, factor analysis was not performed.

As a result, it was found that in all groups under consideration Component 1 is described mainly by explicit variables and Component 2 is described mainly by implicit variables. Component 1 can be called by *Explicit 'overall' hardiness attitude*, and Component 2 by *Implicit 'overall' hardiness attitude* (Figure 6, Table 3).

Table 3

**Rotated Component Matrices**

| Drivers | Component 1 | Component 2 |
|---|---|---|
| Hardiness (Bartone) | **.993** | -.057 |
| Control (Bartone) | **.725** | -.196 |
| Commitment (Bartone) | **.686** | -.212 |
| Challenge (Bartone) | **.681** | .249 |
| Challenge D(IAT) | -.233 | -.002 |
| Hardiness D(IAT) | -.075 | **.839** |
| Control D(IAT) | .040 | **.778** |
| Commitment D(IAT) | -.090 | **.632** |
| **Guards** | Component 1 | Component 2 |
| Hardiness (Bartone) | **.990** | -.074 |
| Challenge (Bartone) | **.725** | -.042 |
| Control (Bartone) | **.619** | -.119 |
| Commitment (Bartone) | .378 | .045 |
| Hardiness D(IAT) | -.055 | **.778** |
| Control D(IAT) | -.083 | **.761** |
| Commitment D(IAT) | .187 | **.667** |
| Challenge D(IAT) | .178 | **-.625** |
| **"Soldiers"** | Component 1 | Component 2 |
| Hardiness (Bartone) | **.996** | .044 |
| Control (Bartone) | **.852** | .012 |
| Commitment (Bartone) | **.773** | .052 |
| Challenge (Bartone) | **.704** | .040 |
| Control D(IAT) | -.017 | **.882** |
| Challenge D(IAT) | .089 | **.792** |
| Hardiness D(IAT) | -.030 | **.758** |
| Commitment D(IAT) | -.066 | -.478 |

Table 4

**Component Score Coefficient Matrices**

| Drivers | Component 1 | Component 2 |
|---|---|---|
| 1 | 2 | 3 |
| Control D(IAT) | .060 | .428 |
| Commitment D(IAT) | .000 | .340 |
| Challenge D(IAT) | -.094 | -.014 |
| Control (Bartone) | .281 | -.066 |
| Commitment (Bartone) | .265 | -.077 |
| Challenge (Bartone) | .289 | .175 |
| Hardiness D(IAT) | .018 | .454 |
| Hardiness (Bartone) | .397 | .026 |
| **Guards** | Component 1 | Component 2 |
| Control D(IAT) | .005 | .373 |
| Commitment D(IAT) | .130 | .343 |
| Challenge D(IAT) | .048 | -.300 |
| Control (Bartone) | .291 | -.022 |
| Commitment (Bartone) | .185 | .045 |
| Challenge (Bartone) | .346 | .023 |
| Hardiness D(IAT) | .020 | .383 |
| Hardiness (Bartone) | .472 | .022 |

Table 4 (Continued)

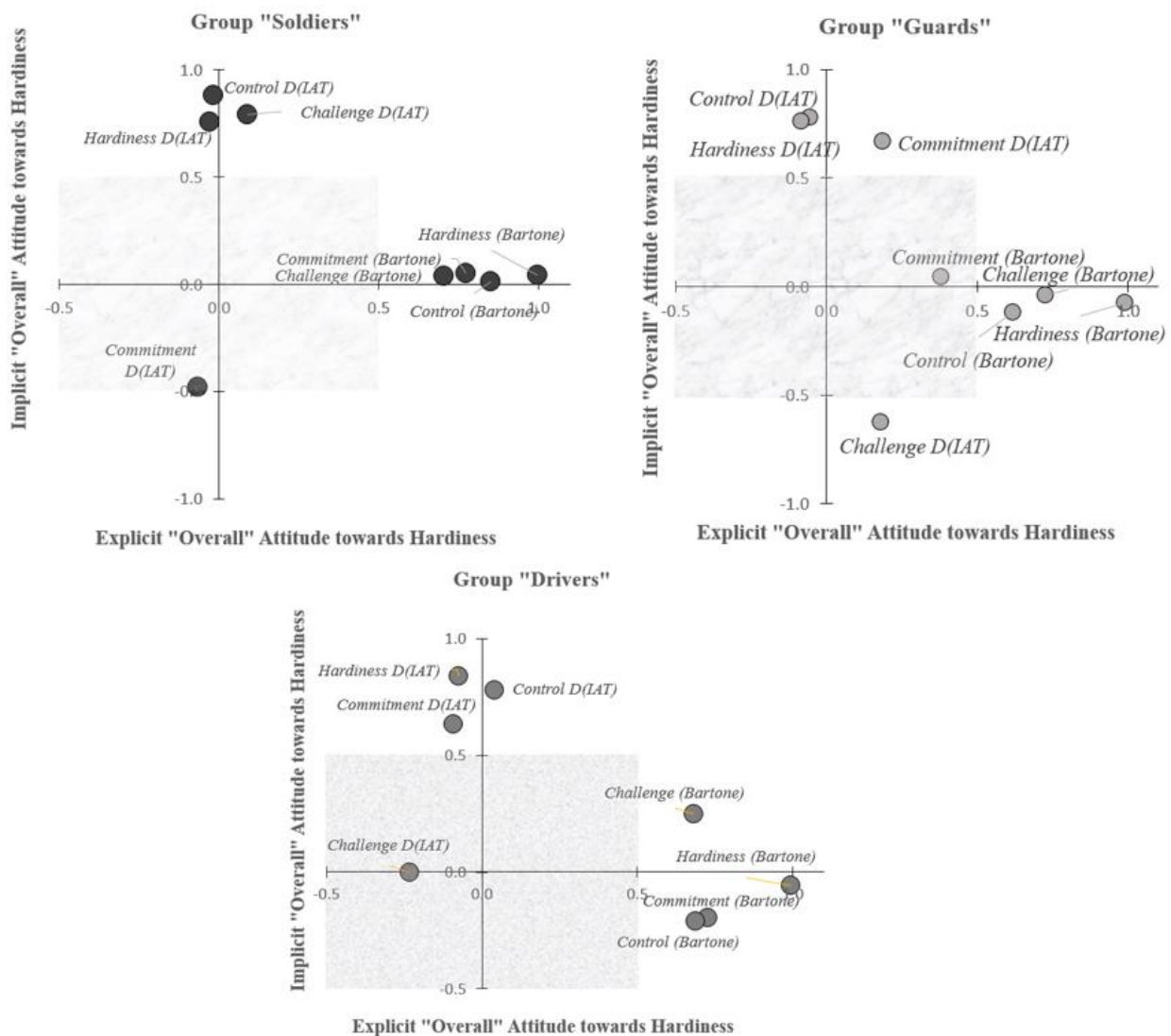| 1 | 2 | 3 |
|---|---|---|
| **"Soldiers"** | Component 1 | Component 2 |
| Control D(IAT) | -.033 | .401 |
| Commitment D(IAT) | -.009 | -.215 |
| Challenge D(IAT) | .008 | .357 |
| Control (Bartone) | .303 | -.020 |
| Commitment (Bartone) | .274 | .001 |
| Challenge (Bartone) | .249 | -.003 |
| Hardiness D(IAT) | -.034 | .345 |
| Hardiness (Bartone) | .354 | -.010 |



**Figure 6. Component Plots in Rotated Space. Explicit
and Implicit 'Overall' Attitudes towards Hardiness**

Figure 7 shows the percentage of variance of the variables that make up the 'overall' implicit and 'overall' explicit attitudes. These percentages are obtained using a rotated component matrix (Table

3) and for a fixed component (column of the matrix) represent the ratio of the square of the factor loading of a variable to the sum of the squares of all factor loadings of that component.
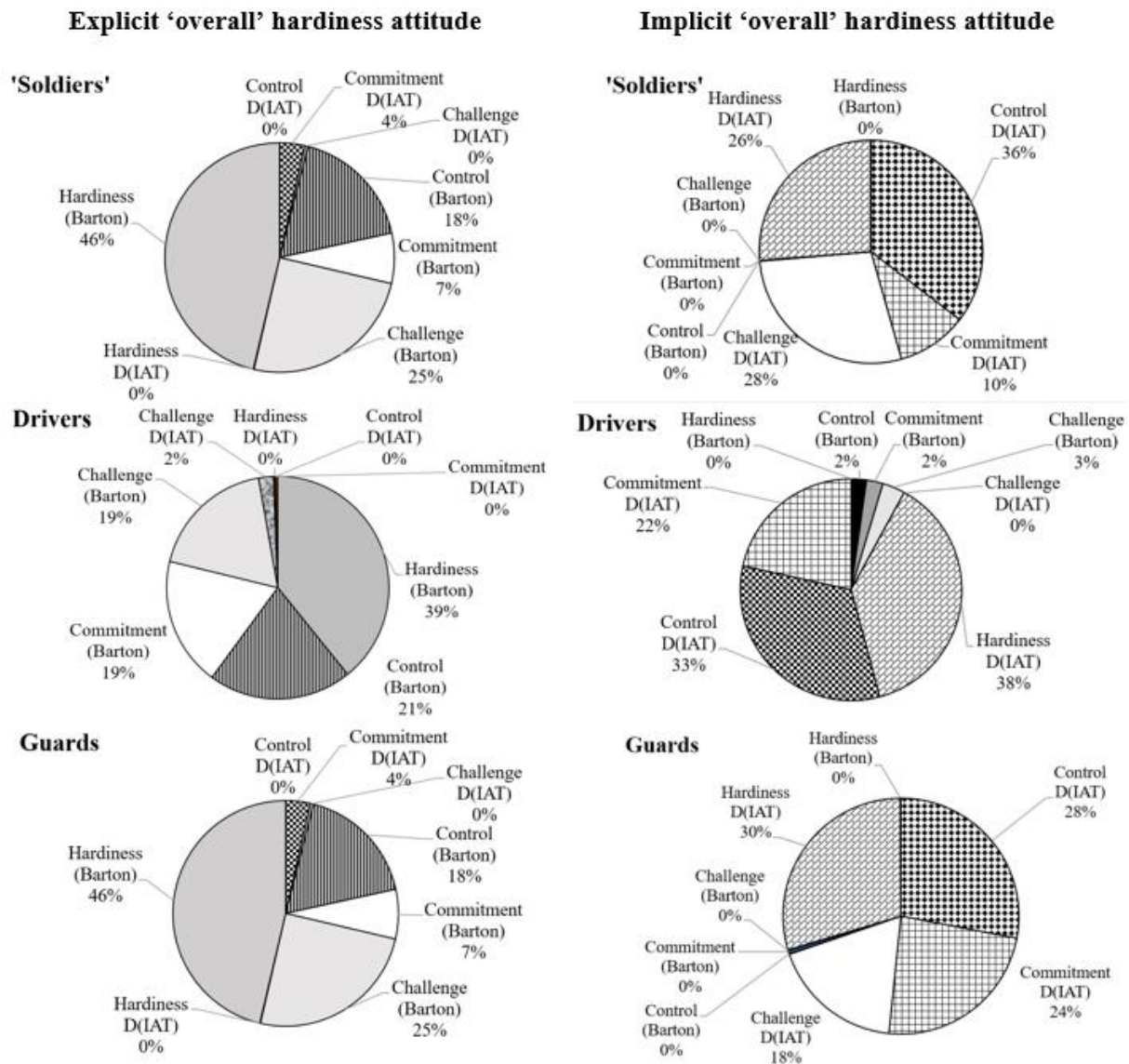


**Figure 7. Variance Percentage of Implicit and Explicit 'Overall' Attitudes and their Constituent Variables**

## Discussion
### Answer to the first research question
The differences in implicit and explicit hardiness and its components among research participants, depending on their occupational group, were revealed.

In the group of participants with profession associated with risk and with the unconditional execution of orders ('soldiers'), the large part of the participants showed the implicit negative commitment. The manifestation of commitment in their activities is strictly regulated, limiting the possibility of leadership, awareness of self-worth and value, and the possibility of full integration into the solution of life tasks. Their implicit associations of isolation, detachment, meaninglessness, monotonous life, boredom with attributes with positive affective valence were stronger than with negatively valenced

attributes. Similarly, the implicit associations of commitment, meaningfulness, involvement, content life, concern were more strongly associated with attributes of negative affective valence. 59% of the participants showed negative implicit commitment, i.e. alienation according to Muddi (2004). Such individuals with negative implicit commitment are not involved in an active life, feeling that they are not important or valuable enough. Most of their lives consist of doing things that have no meaning. They do not enjoy their daily activities. Their lives are boring, uninteresting, and unexciting to them. 65% of participants showed an average level of explicit commitment. And only 8% of the participants have the low level of explicit commitment.

The large part of the security guards, whose work presupposes the presence of stressful situations, and, accordingly, personal qualities that help withstand stress, (e.g. the ability to use physical strength and aggression) as well as the large part of long-distance lorry drivers showed negative implicit challenge, i.e. security according to Muddi (2004). Their implicit associations of stability, consistency, reliability, safety, commonplaceness together with attributes with positive affective valence were stronger than with negatively valenced attributes. Similarly, the implicit associations of dinamicity, changes, risk, uncertainty, search were more strongly associated with attributes of negative affective valence. Most participants in the groups of guards and drivers are implicitly unprepared for changes, especially for unexpected ones. They do not like to make changes to their normal activities. They are afraid of changes. They are incapable of perceiving life situations as a challenge. This is evidently a consequence of their professional activities, in which sudden changes may lead to danger, which they may not have time to react to. Explicitly, they stay more optimistic.

Professional suitability of some individuals can be judged by the results of the implicit tests, e.g., a participant with very negative implicit control (vs. powerlessness) is unlikely to help his team members win competitions. Similarly, 'soldiers' with negative implicit commitment are unlikely to sacrifice their lives in a battle; drivers with negative implicit challenge are unlikely to be able to find a way out in an emergency situation; guards with negative implicit challenge are unlikely to be able to find the right way out in the event of sudden danger.

**Answer to the second research question**

There is a partial implicit-explicit correspondence with effect sizes from small to medium between the results of measurements of hardiness and its components using the appropriate IAT experimental procedures and self-reporting procedures. This correspondence is more pronounced and has the near to large effect size for the long-distance lorry drivers.

The correspondence between the results of implicit and explicit measurements can be checked either by using correlation coefficients or by counting the number of matches. The results of the second method are more reliable. An analysis of numerous empirical studies conducted in recent years points to conflicting judgments about the understanding of correlations between implicit and explicit dimensions of the same psychological construct (Gawronski et al., 2020).

According to the authors, the use of correlation coefficients requires careful correlation analysis, taking into account variables that might influence the relationship. Non-linear effects should also be taken into account. The relationship may not be correlated at all. Therefore, the formal calculation of correlation coefficients may lead to incorrect conclusions. At least, different variables and associated different subsets of participants, as well as experimental conditions that influence the correspondence of implicit and explicit measurement results need to be taken into account (cf. Fazio & Olson, 2003; Rudman, 2013; Urbane et al., Plotka et al, 2021a; Plotka et al., 2021b; Plotka et al., 2019; Plotka et al., 2018; Vinogradova et al., 2018, Plotka et al., 2016).

In the present study, implicit-explicit correspondence depends on the occupational group of the participants. Formal calculation of correlation coefficients found implicit-explicit consistency, inconsistency, and uncertain consistency. However, calculating the number of matches changes the situation a lot.

The lowest number of matches (12%-26%) was found in the group of 'soldiers'. The use of correlation coefficients for hardiness and 3Cs revealed only uncertain consistency.

A low number of matches (8%, 11%, 19% for commitment, hardiness, control respectively) was also shown in the group of 'guards'. For commitment, consistency was found with a small effect size; for hardiness, a statistically significant inconsistency with an effect size close to the medium was stated, and for the remaining constructs, an uncertain consistency was revealed.

The highest number of matches (63%, 73%, 78% for control, hardiness, commitment respectively) was found in the drivers' group. It is possible that this is because long-distance lorry drivers have a greater possibility for introspection, which may increase awareness of previously unconscious (sub) implicit representations. This may lead to increased correspondence between explicit and implicit measures (Hofmann et al., 2005). Although correlation coefficients for hardiness and challenge revealed inconsistency. Commitment and control showed uncertain consistency, which can only be explained by the fact that correlation analysis was not carried out thoroughly enough.

A rather high number of matches (48%, 52%, 56% for commitment, hardiness, control respectively) were also found in the group of footballers. For control, consistency was revealed with a low effect size, and for commitment, inconsistency with an effect size between small and medium was shown. For hardiness and challenge, there is uncertain consistency.

Contradictory results show a comparison of participants' distributions for the levels of implicit and explicit variables (Figure 1).

Some of the participants have different scores on the explicit and implicit variables, which can be explained by the specifics of their occupations, which are risky, as their activities regulate their behaviour and limit the manifestations of hardiness aspects, e.g., commitment. This regulation may affect the intrinsic implicit determinants of actual behaviour, but it does not limit the representation of desired behaviour as measured by the explicit method.

The results obtained in the present study support Fazio and Olson's (2003) suggestion that there are experimental conditions under which consistency between implicit and explicit measurements can exist.

**Answer to the third research question**

The common factors underlying the relationship between implicit and explicit hardiness and its components are the "implicit 'overall' hardiness attitude" and the "explicit 'overall' hardiness attitude".

The "implicit 'overall' hardiness attitude" in the **drivers' group** consists of 93% associations and 7% propositions. The "explicit 'overall' hardiness attitude" composition contains 2% associations and 98% propositions.

The "implicit 'overall' hardiness attitude" in the group of **'soldiers'** consists of 100% associations and 0% propositions. The "explicit 'overall' hardiness attitude" composition contains 4% associations and 96% propositions.

The "implicit 'overall' hardiness attitude" in the **guards' group** consists of 100% associations and 0% propositions. The "explicit 'overall' attitude" composition contains 4% associations and 96% propositions.

It was revealed that the greatest contribution to "explicit 'overall' hardiness attitudes" in the groups of 'soldiers', guards and drivers is made by explicit hardiness. The greatest contribution to the "implicit 'overall' hardiness attitude" in the groups of guards and drivers is made by implicit hardiness, in the group of 'soldiers' – by implicit control (Table 4).

The variables "Explicit 'overall' hardiness attitude" and "Implicit 'overall' hardiness attitude" constructed using factor analysis are independent: the correlation between them is equal to zero. The hypothesis can be put forward that 'overall' implicit and 'overall' explicit attitudes towards hardiness are independent constructs.

According to a meta-analysis (Hoffman et al., 2005), psychological constructs that can be assessed by implicit and explicit measures may be completely independent. Implicit measures can be used to assess aspects of a psychological construct that cannot be assessed using explicit measures. The combined use of implicit and explicit measures not only provides additional information about the adequacy of measurements using both measures, but also leads to a deeper understanding of the construct under study (Rudman, 2013).

There are many theories and studies of implicit-explicit duality in the attitudes literature, an overview of which is presented in the study (Gawronski & Brannon, 2019). There are quite a few psychological phenomena in which the independence of explicit and implicit attitudes is revealed and is not revealed.

The independence of explicit and implicit 'overall' attitudes was observed in research on self-esteem theory, where the hypothesis of 'overall' attitudes independence was also considered (Plotka et al., 2016), in research on self-esteem (Pietschnig et al., 2018), and in a study of general implicit and explicit attitudes towards domestic and foreign food brands (Urbane et al., 2021).

A limitation of this study was that it did not control for mediator variables for correspondence of measurement and that it did not investigate the association of attitudes with the participants' personality traits, the same ones in all four groups.

The prospect for further research is to look at other occupational groups of participants.

**Conclusions**

The study was conducted for four groups of participants whose occupations are associated with risk: with occupations associated with risk and with the unconditional execution of orders ('soldiers'), security guards, long-distance lorry drivers, and professional football players from one of the top football league teams. Measurements were made using specially designed four modifications of the classical IAT and the self-report procedure DRS-15. The study showed that there are differences in implicit and explicit attitudes towards hardiness and its components in groups of participants from different occupations. Most guards and long-distance lorry drivers revealed a negative implicit challenge. The majority of 'soldiers' were found to have negative attitudes towards the commitment. The vast majority of drivers showed matches of the measurements results, which can be explained by their professional possibility for introspection. The independence of implicit and explicit 'overall' attitudes toward hardiness, and their content, is also shown.

The aim of the study was achieved and the answers to the research questions were obtained.

Although a study of implicit and explicit attitudes has already been carried out for each of the groups, there has not been a study of all occupational groups at once.

The results can be used to determine professional suitability, because they provide implicit estimates that can be obtained relatively easily and quickly.

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# THREE PSYCHOLOGICAL CONSTANTS OF FREE WILL

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**Abstract.** The article examines the three psychological constants of free will: 1) the existence of a choice of actions, 2) independent decision-making, and 3) the variability of existing options. The author defines that the cancellation of one of the given constants will lead to the levelling of freedom of will. The article examines how limiting the options for choosing actions occurs by creating a dilemma, a false dilemma, or when we apply "Hobson's choice" or the catch-22 technique. The author emphasises that there are other ways of influencing free will, but they are united by a single goal – to create circumstances when the choice of actions will be limited. The academic proves that a person always has the freedom to choose actions. Exceptions are only cases of unconsciousness and not being aware of one's actions. The author substantiates the thesis that the basis of social relations is the concept of the existence of free will.

**Key words:** free will, decision-making, limiting of choosing actions, the autonomy of will, Hobson's choice, dilemma, catch-22.

**Introduction**. The issue of free will is the subject of scientific research in psychology, philosophy and jurisprudence. Different branches of science offer their understanding of free will, essential for solving fundamental questions.

Psychology tries to understand decision-making algorithms and the nature of motivation. Philosophy offers concepts of the existence and exclusion of human free will. Jurisprudence defines free will as the basis of branches and sub-branches of law and their institutions. However, despite the different meanings of free will for psychology, philosophy and jurisprudence, we believe that the fundamental idea of free will and its understanding coincide in these sciences. The psychological understanding of free will has its specificity and is based on three constants.

**State of scientific development.** The scientific doctrine has studied the concept of free will in psychology. Among the leading academics who studied these questions, we should be noted Alfred R. Mele (Surrounding Free Will: Philosophy, Psychology, Neuroscience), John Baer, James C. Kaufman and Roy F. Baumeister (Are We Free? Psychology and Free Will), Myers, David G (Determined and Free), Garner, Bryan (Garner's Modern American Usage), A.J Giannini (Use of fiction in therapy), Barrett Grant (Hobson's Choice), Nichols Shaun (How Can Psychology Contribute to the Free Will Debate?), Vohs K. D. & Schooler J. (The value of believing in free will: Encouraging a belief in determinism increases cheating), Alquist J., & Baumeister R. F. (Induced disbelief in free will leads to heightened conformity to others' judgments).

At the same time, there is a lack of research on free will. The relationship between free will and psychology is not revealed by scientific doctrine.

**The aim of the study.** Determine the three psychological constants of free will.

**Research methods.** General scientific and unique scientific methods of cognition are applied: logical (deduction and induction, analysis and synthesis, abstraction and comparison); hermeneutic (regarding the understanding of scientific texts); formal-dogmatic.

**Results of the study.** *We defined* the three psychological constants of free will: 1) the existence of a choice of actions, 2) independent decision-making, and 3) the variability of existing options. From this, we can assume that the cancellation of one of the given constants will lead to the levelling of freedom of will.

The psychology of philosophy is a messy business. The diverse range of philosophical problems that emerge from commonsense probably has an almost equally diverse set of psychological causes. In the case of free will, S. Nichols suggested that the problem is driven by the explanatory compulsion on the one hand and the indeterminist intuition on the other (Nichols, 2015).

The psychological understanding of free will is based on the concept of a "free man" – a person who respects rational authority, acts responsibly, has self-respect, and is conscious of his or her part in decision-making (Myers, 2008). R.F. Baumeister proved that free will is the assumption that more than one course of action is possible for a given person in a given situation (Baumeister, 2010). Hence, the person really makes a choice, in the sense that some act is possible and then ceases to be possible. Free will is the capacity to choose between different possible acts (Baumeister, 2010). This thesis illustrates three psychological constants of free will: 1) the existence of a choice of actions, 2) independent decision-making, and 3) the variability of existing options. From this, we can assume that the cancellation of one of the given constants will lead to the levelling of freedom of will.

Let's consider several ways to influence free will by limiting choice options.

The situation with no choice can be a dilemma when all the proposed options do not suit us, but we must decide. The possibilities are termed the *horn* of the dilemma, a clichéd usage, but distinguishing the dilemma from other kinds of predicament as a matter of usage (Garner, 2009). For example, a soldier is ordered to kill civilians or is arrested for disobeying the order. A military serviceman believes he has no choice and is following the order. But he still makes the decision himself because he is the one who chooses whether to accept the order or violate it. That is, alternatives always exist, even when they are limited and not obvious.

A false dilemma (false dichotomy, false binary) exists when all the proposed options are based on false arguments. R. Fairbairn described this theory as the concept of "splitting". A false dilemma is based on contrasting two options as extremes. In this case, there is a contrasting opposition of the dichotomy of opposite results or properties. As a result, "black-and-white thinking" occurs. An example is people categorising others as "all good" or "all bad" (Giannini, 2001).

N. Disantis wrote the following example of a false dilemma: A common argument against noise pollution laws involves a false choice. It might be argued that in New York City noise should not be regulated, because if it were, a number of businesses would be required to close. This argument assumes that, for example, a bar must be shut down to prevent disturbing levels of noise emanating from it after midnight. This ignores the fact that law could require the bar to lower its noise levels, or install soundproofing structural elements to keep the noise from excessively transmitting onto others' properties (Desantis, 2012). With the help of a false dilemma, there is an influence on decision-making and, therefore, on free will.

In sales techniques, the "choice without choice" technique is used. The essence of this technique is that you offer options with a choice that suit you in advance and best suit the interlocutor's request (Musatov*, 2022*). Classic example: Would you like tea or coffee? In this way, we artificially limit the choices. However, this is not a compulsion because we can always refuse the proposed options. "Choice without a choice" should be distinguished from Hobson's choice, which consists of choosing from only one option.

T. Hobson used this technique. He had an extensive stable of some 40 horses. This gave the appearance to his customers that, upon entry, they would have their choice of mounts, when in fact, there was only one: Hobson required his customers to take the horse in the stall closest to the door.

This was to prevent the best horses from always being chosen, which would have caused those horses to become overused (Grant, *2009*).

Hobson's Choice should not be equated with a catch-22. A catch-22 is a paradoxical situation from which an individual cannot escape because of contradictory rules or limitations (Largest Idioms Dictionary, 2020). In this case, the decision-making conditions are constructed so that one's choice leads to pre-planned results. This is a type of manipulation.

G. Fitz gives an example: "Most refugees do not have a legal way of reaching safety in the rich democracies of the Global North. The only realistic way to reach the Global North is to reach its territory and ask for asylum. Rich democracies typically abide by the principle of non-refoulment but deliberately and systematically shut down most legal paths to safety. An architecture of repulsion based on cages, domes, buffers, moats, and barbicans keeps out asylum seekers and other migrants. Australia, Canada, the United States, and the European Union have converging policies of remote control to keep asylum seekers away from their territories. The catch-22 for refugees is that rich democracies are essentially telling them, "We will not kick you out if you come here. But we will not let you come here". (FitzGerald, *2019*).

A more straightforward example of such manipulation can be demonstrated schematically:
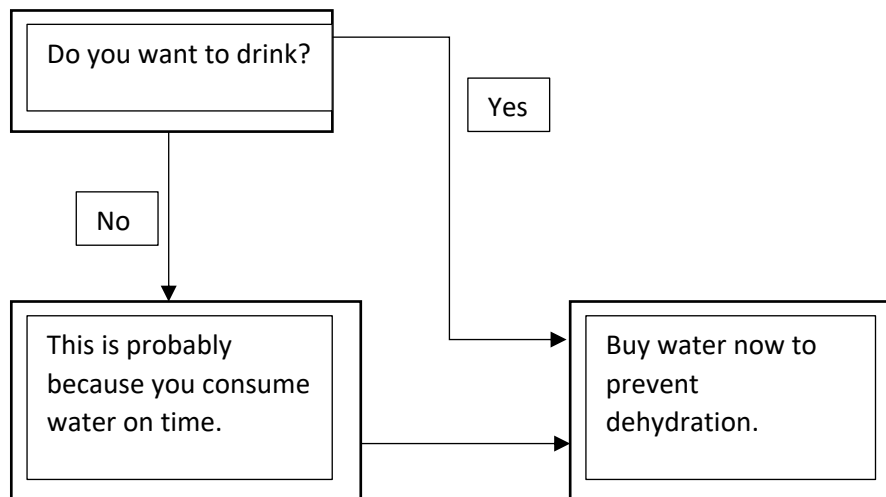


**Figure 1**

There are other ways of influencing free will, but a single goal unites them – to create circumstances for the choice of actions will be limited. The ability to oppose one's free will to external influence is associated with willpower and self-control. Willpower is an agent's capacity to sustain, stop, amplify, or otherwise modify an incipient or unwanted response or action. Self-control is often associated with conscious effort and often involves overriding a default course of action (Mele, 2014). However, the definition of these categories requires a separate study.

The above methods of psychological influence must not violate legal norms and are not grounds for recognising the acts as invalid due to will defects. This is based on the absence of coercion and deception, and the person makes the final decision independently, even in case of threats or blackmail. For example, if a person is threatened with death if he does not sign a document, he decides to comply with the requirements. Of course, from the standpoint of the law, such a deed will be considered null and void. But from the point of psychology, a person makes decisions of his own free will.

Thus, a person always has the freedom to choose actions. Exceptions are only cases of unconsciousness and not being aware of one's actions.

From this comes the second constant of freedom of will, the independence of decision-making. In this context, decision-making by the legal representative is essential. For example, when parents take their children to the hospital, they order medical services. We assume that legal representatives must act in the child's best interests. But, in reality, the parents, not the child, make decisions and exercise their free will. From the standpoint of the law, the child becomes the patient, and the contract for providing medical services is concluded as an exercise of his free will. However, from the point of view of psychology, free will was levelled due to violating its second constant.

The third constant of free will, which comes from the position of R.F. Baumeister, is the variability of existing options. This means that free will is always exercised considering the existing options when expressing the will. The specified characteristics limit the range of possibilities for realising freedom of will. For example, the volume of information during decision-making limits freedom of will to the limits of knowledge. When a person decides, he proceeds from the available data, views, experiences, etc. If a person buys a mobile phone at the specified price, he exercises his free will. The person needs to learn that this phone can be purchased on more favourable terms. In this case, free will can be manifested in two simple forms: to buy or not to buy a phone. If the buyer had more information, the exercise of free will could undergo other options.

B. Berofsky writes, "If we look more closely at the intuitive idea of free will or free agency, we find several independent strands. The openness to a deliberating agent of a variety of options is certainly one central idea. The past does not close off the option we fail to choose. It was there for the choosing until we actually terminate the deliberative process. This component of free agency is called *alternative possibilities"* (Berofsky, 2012).

At the same time, the third constant of free will comes down to the fact that the options for choice and exercise will constantly change due to the dynamics of external circumstances and personality development.

When one of the constants of free will is violated, the individual's autonomy is suppressed. At this moment, free will is not manifested or is manifested in a limited way. Today, there is no absolute scientific position regarding free will. This is due to the impossibility of empirically proving its existence. Such a process could be compared to studies of "how much the soul weighs". However, existing concepts of free will can be schematically summarised.
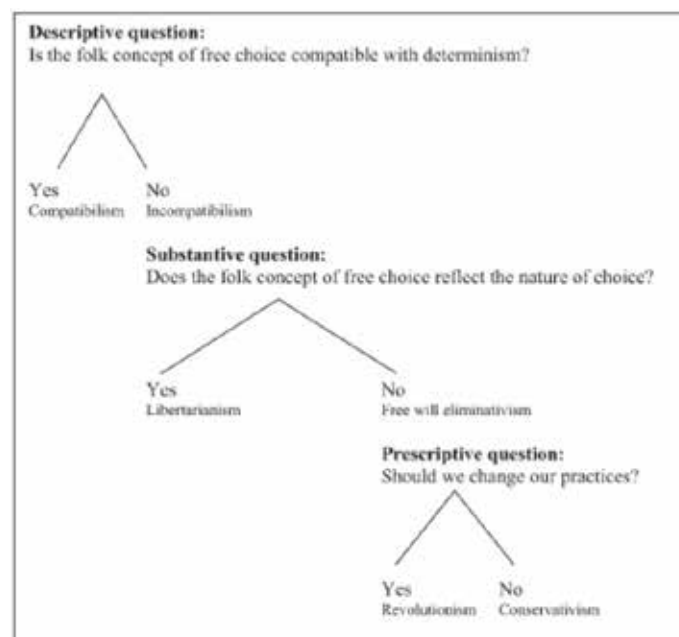


**Figure 2 (Nichols, 2008)**

Some psychologists think that free will is an illusion. J. Bargh writes, "The phenomenological feeling of free will is very real … but this strong feeling is an illusion, just as much as we experience the sun moving through the sky, when in fact it is we who are doing the moving.» (Bargh, 2008). D. Wegner concludes: "It seems we are agents. It seems we cause what we do …. It is sobering and ultimately accurate to call all this an illusion." (Wegner, 2002). But free will acts as a measure of possible behaviour and decision-making. As the study of Vohs and Schooler showed, a person can be convinced of the presence or absence of a free will. People convinced of determinism and the absence of free will became inclined to violate the norms of law and morality (Vohs & Schooler, *2008)*. Such a result showed that the belief in the absence of free will made it possible to shift responsibility because "my actions are foreseen and do not depend on me".

C. Taylor and D. Dennett write, "Incompatibilism, the view that free will and determinism are incompatible, subsists on two widely accepted, but deeply confused, theses concerning possibility and causation: (1) in a deterministic universe, one can never truthfully utter the sentence "I could have done otherwise," and (2) in such universes, one can never really receive credit or blame for having caused an event, because in fact all events have been predetermined by conditions during the universe's birth" (Taylor & Dennett, 2011).

Over time, people who did not believe in free will underwent psychological deformation, became more dependent on other people's opinions and lost their individuality (Alquist & Baumeister, *2008)*. However, the basis of social relations is the concept of the existence of a free will. If we recognised the absence of a free will, some sciences would lose their meaning altogether. For example, psychology and law are based on the fact that a person makes his own decisions.

And although people may acknowledge many external and internal factors that help shape their behaviour and that of others, people generally act as if they possess free will. They certainly act as though they believe in their own free will (Baer, Kaufman & Baumeister, *2008)*.

**Conclusions**. The research demonstrates three constants of free will: 1) the existence of a choice of actions, 2) independent decision-making, and 3) the variability of existing options. Violation of one of the given constants leads to restriction of free will. Limiting the options for choosing actions occurs by creating a dilemma, a false dilemma, or when we applying "Hobson's choice" or the catch-22 technique. The ability to oppose one's free will to external influence is associated with willpower and self-control. There are other ways of influencing free will, but they are united by a single goal – to create circumstances when the choice of actions will be limited. The above methods of psychological impact do not violate legal norms. They are not a basis for recognising transactions as invalid due to defects of will if there is no coercion and deception and the person makes the final decision independently.

A person always has the freedom to choose actions. Exceptions are only cases of unconsciousness and not being aware of one's actions. When legal representatives make decisions, they must act in the interests of the person they represent. But the representatives exercise freedom of will, not the person they represent.

Free will is always exercised considering the options that exist at the moment of expression of will. When a person decides, he proceeds from the available information, views, experiences, etc. The specified characteristics limit the range of possibilities for realising freedom of will. The third constant of free will comes down to the fact that the options for choice and exercise will constantly change due to the dynamics of external circumstances and personality development.

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# RESEARCH OF EMOTIONAL INTELLIGENCE AND PSYCHOLOGICAL WELL-BEING

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**Abstract.** Goal: find out if there is relationship between emotional intelligence and psychological well-being. Participants: 112 people aged from 18-36. Method: the research is based on comparison of levels under scales of psychological well-being and scales of emotional intelligence. Results: positive significant correlations where found between both emotional intelligence variables and psychological well-being scales. Conclusion: Detailed analysis demonstrates positive relationship between the components of emotional intelligence and psychological well-being.

**Key words***:* emotional intelligence, psychological well-being, eudemonism, hedonism, empathy, self-acceptance.

**Introduction.** People live in a social reality with which it is constantly necessary to interact to one degree or another. An individual somehow strives for well-being in this world, which is formed from many factors, such as the type of activity, environment and, of course, relationships with other people. These relationships impossible to describe without a person's personal qualities, his own emotional reactions, understanding of other people's emotional reactions, and the ability to manage them.

Nowadays, the issue of well-being is very acute, people spend much less time in each other's company than it did a few years ago, which cannot but leave its mark on the general state of the psyche.

L.S. Vygotsky also wrote in his work "Psychology of Art" that intelligence and effect are one. It is rational to assume that competent and effective interaction with other individuals is impossible without awareness of one's own emotions and other people's emotions, the ability to regulate and control them. Thus, this study will focus on the relationship of emotional intelligence with psychological well-being.

The methodological basis of the study is questionnaire "Scale of psychological well-being" by K. Riff (1989) in the adaptation of Fesenko P.P. and Shlevenskaya T.D., and the questionnaire of emotional intelligence "EmiN" by D. V. Lyusin (2006).

In her questionnaire of psychological well-being, K. Riff considered psychological well-being itself as a multifactorial model having six scales: positive relationships with others, autonomy, environmental management, personal growth, purpose in life, self-acceptance.

D. V. Lyusin interprets the concept of emotional intelligence as the ability to understand and manage one's own and others' emotions. In his understanding, it is worth giving more importance to intrapersonal emotional intelligence and interpersonal emotional intelligence, since they can allow better understanding of both your own emotions and the emotions of another person.

Aim of the research: Investigation of connection between emotional intelligence and psychological wellbeing of adults.

Hypothesis: Emotional intelligence is connected with psychological wellbeing of adults.

**Theoretical basis.** Psychological well-being is a state of happiness and contentment, with low levels of distress, overall good physical and mental health and outlook, or good quality of life (APA, 2022).

The theoretical basis for understanding the phenomenon of psychological well-being was laid by the studies of N. Bradburn, according to whom, to describe this phenomenon, it is necessary to

operate with signs that reflect the state of happiness or unhappiness, a subjective feeling of general satisfaction or dissatisfaction with life (Bradburn, 1969).

For a full-fledged study of psychological well-being as a concept, it is necessary to identify the main approaches to its study, i.e., eudenomic and hedonistic theoretical approaches.

The eudaimonic approach states that happiness is the result of full psychological functioning, through which a person can develop and realize his potential.

The hedonic approach, in turn, defines happiness as the predominance of positive emotions over negative emotions (Vázquez et al., 2009).

Speaking of eudemonism, it is impossible not to mention the multidimensional model of psychological well-being by K. Riff, aimed at realizing the potential of the individual through six key characteristics: autonomy, environmental control, personal growth, positive relationships with others, purpose in life and self-acceptance.

K. Riff notes that the identified components of psychological well-being correlate with various structural elements of theories, in which one way or another we are talking about the positive functioning of the individual. For example, "self-acceptance" (as a component of psychological well-being according to K. Riff) correlates not only with the concepts of "self-respect" and "self-acceptance" introduced and developed by A. Maslow, K. Rogers, G. Allport and M. Yahoda. It also includes a person's recognition of his strengths and weaknesses, correlated with the concept of individuation by C. G. Jung, as well as a mostly positive assessment of a person's own past, described by E. Erickson as part of the process of ego integration.

Emotional intelligence – a type of intelligence that involves the ability to process emotional information and use it in reasoning and other cognitive activities (APA, 2022).

E. L. Thorndike, a professor at Columbia University, USA, in 1920, was the first to try to introduce a measurement of another intelligence manifested by people with social skills and called "social intelligence". E. L. Thorndyke defined social intelligence as a human ability that can have an idea of the internal situation, what behavior is and what stimuli exist. He also determined that social intelligence is a person's ability to manage other people and social interactions, as well as to be able to make the right social judgment in any case (Landy, 2005).

The concept of the "emotional intelligence" was widely introduced into psychological usage in 1990 by J. Meyer & P. Saloway. They defined emotional intelligence as "a group of mental abilities that contribute to awareness and understanding of one's own emotions and emotions of others" (Mayer & Saloway, 1990).

However, it was only after the publication of the book "Emotional Intelligence" by Daniel Goleman that an active study of this phenomenon began, attempts made not only to understand the nature of this structure, its development and features, but also to apply it in practice. In his book, Daniel Goleman defines emotional intelligence as "a way, a method, a form of a person's treatment of himself and others" (Goleman, 1995).

In the understanding of another scientist R. Bar-On, emotional intelligence is not a cognitive ability, but knowledge and competence that enable a person to successfully cope with various life situations (Bar-On et al., 2000) In his works, the author has deduced five spheres of emotional intelligence: intrapersonal, interpersonal relationships, adaptive, stress regulation and mood sphere (Bar-On et al., 2000).

Russian scientist D.V. Lyusin, in contrast to R. Bar-On, noted the presence of a cognitive component, otherwise it would be impossible to apply the term intelligence. R. Bar-On, to measure the above components of emotional intelligence, created an EQ-i questionnaire to determine the emotional coefficient, in this case an analogue of the intelligence coefficient. The absolutely new, was the opportunity to consider not only adults, but also children's population (from 6-18 years old)

**Analysis of past empirical studies on Emotional Intelligence and Psychological wellbeing connection.** The scientific literature emphasizes the important role of emotional intelligence in determining the psychological well-being (happiness) of an individual (Bar-On & Parker, 2000).

Many researchers associate emotional intelligence with psychological constructs that are closely related to subjective well-being (Cejudo et al., 2018; Balluerka et al., 2016).

It was found that high rates of positive emotional states and a decrease in negative emotional states (Sánchez-Álvarez et al., 2015), life satisfaction (Bar-On & Parker, 2000; Seligman et al., 2009; Austin et al., 2005; Fernández-Berrocal et al., 2004) are the best psychological functioning and social competence (Rivers et al., 2012) as well as more favorable social relations (Dawda & Hart, 2000).

Other studies have focused on the relationship between emotional intelligence and variables related to the well-being of young people, such as physical and mental health (Fernández-Berrocal & Extremera, 2016; Petrides et al., 2016; Martins et al., 2010), as well as stress perception (Mikolajczak et al., 2007).

Consequently, it can be stated that there is clear evidence that emotional intelligence abilities predict aspects related to personal well-being and a positive relationship between life satisfaction and subjective happiness (Mikulic et al., 2010; Rey et al., 2005).

In connection with previous studies, the Oxford Happiness Questionnaire was compiled, which evaluates subjective happiness in terms of these psychological dimensions, including items focused on life satisfaction, positive emotions, physical and mental health or social relationships (Hills & Argyle, 2002).

Also, studies conducted on the basis of mixed models note that the trait of emotional intelligence is a combination of abilities and self-perception associated with emotions (Petrides & Furnham, 2001).

In this regard, various studies have noted the existence of a positive correlation between emotional intelligence as a character trait and perceived happiness (Chamorro-Premuzic et al., 2007; Petrides & Furnham, 2003).

I would like to note that it should be taken into account that self-perception and attitudes related to people's emotions, such as emotional regulation, relationship skills and social competence, largely determine variations in happiness (Petrides & Furnham, 2003).

Recent research shows that emotional intelligence abilities imply a skill that allows people to direct their thoughts and reflect on their emotions, helping them improve their well-being (Teal et al., 2018).

All these studies suggest that important interventions can be carried out, contributing to a significant improvement in the quality of life and happiness, increasing emotional intelligence with the help of special cognitive training (Callea et al., 2016).

**Method. Participants.** 112 participants, 64 female participants aged 18 to 36, Mdn=23.5.

48 male participants aged 18 to 36 Mdn=22.

Participants live in the CIS and Latvia.

**Instruments.** "Test of emotional intelligence of Lyusin" ("Questionnaire for measuring emotional intelligence", EmIn) (Lyusin, 2006).

Ryff Psychological Wellbeing Scale (PWB) (1989) Adapted by T.D. Shevelenkova and T.P. Fesenko, (2005).

Demographic questionnaire.

**Measures. "Psychological Wellbeing Scale", PWB, (Ryff, 1989).** The methodology provided to the respondents is a Russian-adapted version of the original English-language methodology. Scales of psychological well-being, developed by Karol Riff. The technique been repeatedly validated in different variations. The most common is the 84-point variant, which is the basis for two Russian-language versions: in 2005, the questionnaire adapted and validated by T.D. Shevelenkova and T.P. Fesenko.

Version of T. D. Shevelenko – T. P. Fesenko.

The 84-point version of the scale, translated by A.M. Abdrazyakova (Abdrazyakova, 2002), was adopted as the basis for validation, each question has a six-point scale in direct and inverse values, 1 is the minimum score, 6 is the maximum score. The text of the questionnaire was also amended, important from the point of view of the authors.

Meaningful interpretation of scales.

*The "Positive relationships with others" scale.*

The respondent with the lowest score has a small number of trusting relationships with others. It is difficult for such a person to be open with others, to show warmth and care. In interpersonal relationships, he is most likely isolated and frustrated. Unable to make compromises to maintain connections with other people.

The respondent who scored the highest score has a satisfactory, trusting relationship with others. Such a person cares about the well-being of others, he is also able to empathize, allows attachments and close relationships, is well aware that human relationships built on mutual concessions.

*The "Autonomy" scale.*

A low score characterizes a person as dependent on the opinions and assessments of others. When making important decisions, such a respondent relies on the opinion of others. He easily succumbs to society's attempts to force him to think and act in a certain way.

A high score on this scale characterizes the respondent as independent and independent, able to resist the attempts of society to force them to think and act in a certain way. Such a respondent is able independently manage his own behavior. He also evaluates himself according to personal criteria.

*The "Environment Management" scale.*

A low score on this scale characterizes the respondent as a person, who has trouble in organizing daily activities. Such a person feels unable to change or improve the circumstances, is indifferent to the opportunities provided, is deprived of a sense of control over what is happening around.

With a high score, the respondent has control and competence in managing the environment, he controls all external activities, competently uses the opportunities provided, can capture or create conditions and circumstances suitable for meeting personal needs.

*The scale of "Personal growth".*

The respondent with the highest scores has a sense of constant development, perceives self-fulfilling, open to new experiences. He feels a sense of realizing his potential, observes improvements in himself and his actions over time. He also changes according to his own knowledge and achievements.

The respondent with the lowest score feels the lack of self-development, does not feel a sense of improvement or self-realization. He experiences boredom and has no interest in life, feels unable to establish new relationships or change his behavior over time.

*The "Purpose in Life" scale.*

A subject with high scores on this scale has a purpose in life and a sense that life directed. He believes that past and present life has meaning. He also holds beliefs that are sources of purpose in life. He has intentions and goals for life.

A subject with a low score is devoid of meaning in life. Such a subject has few goals or intentions. He has no sense of direction, he does not find a purpose in his past life, has no prospects or beliefs that determines the meaning in later life.

*The "Self-acceptance" scale.*

The highest score characterizes the respondent as a person who has a positive attitude towards himself, knows and accepts his various sides, including good and bad qualities, positively evaluates himself and his past.

The respondent with the lowest score is not satisfied with himself, disappointed with the events of his past. He is worried about some personal qualities, wants to be not who he is.

**"Test of emotional intelligence of Lyusin" ("Questionnaire for measuring emotional intelligence", EmIn) (Lyusin, 2006).** The D. V. Lyusin questionnaire measures emotional intelligence (EI), which is interprete as the ability to understand one's own and others' emotions and manage them. In the structure of EI, interpersonal EI stands out – understanding of other people's emotions and managing them, intrapersonal EI – understanding of one's own emotions and managing them, the ability to understand one's own and others' emotions, the ability to manage one's own and others' emotions. The EmIn questionnaire gives scores on two subscales measuring various aspects of intrapersonal EI and on three subscales measuring various aspects of interpersonal EI.

**Intrapersonal EI**

*UP scale. Understanding other people emotions.* The ability to understand the emotional state of a person based on external manifestations of emotions (facial expressions, gestures, voice sound) and/or intuitively, sensitivity to the internal states of other people. Low scores on this scale indicate difficulties in understanding other people's emotions. High scores indicate easy recognition of other people's emotions.

*The ME scale. Managing other people emotions.* The ability to evoke certain emotions in other people, to reduce the intensity of unwanted emotions. Perhaps a tendency to manipulate people. High scores indicate the ability to control other people's emotions, if required. Low scores indicate an inability to control other people's emotions.

**Intrapersonal EI**

*The UO scale. Understanding own emotions.* The ability to be aware of one's emotions: their recognition and identification, understanding of the reasons, the ability verbally describe. Low scores indicate difficulties in understanding their emotions, confusion between some emotions, inability verbally describe them. High scores indicate a good understanding of your feelings, the ability to identify them and describe them correctly.

*MO scale. Managing own emotions.* The ability and need to manage your emotions, to evoke and maintain desirable emotions and keep unwanted ones under control. Low scores indicate difficulties with controlling emotions, this, for example, can expressed in spikes of aggression. High scores allow you to take emotions under control, keep a stable mood.

The EC scale. Expression control. The ability to control the external manifestations of their emotions. High expression control helps to hide emotions, for example, not to blush with shame or not to gesticulate excessively. Low expression control indicates pronounced manifestations of emotions, noticeable facial expressions and excessive gesticulation.

**Results.** Data was processed with SPSS 22 program. Statistically significant results were found. Positive significant connections was found between scales of EQ and scales of PWB, by using Pearson's and Spearman's correlations.
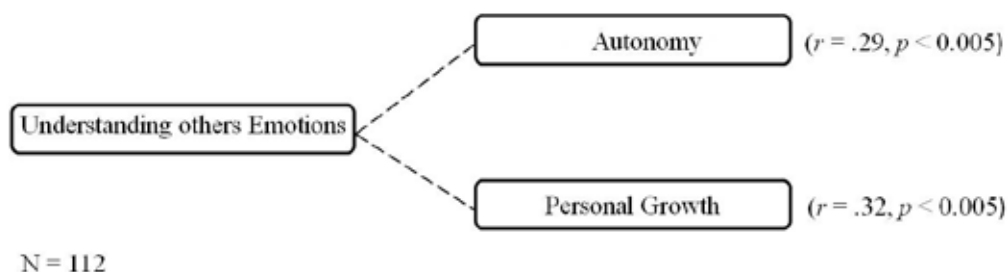


Understanding others Emotions → Autonomy ($r = .29, p < 0.005$)

Understanding others Emotions → Personal Growth ($r = .32, p < 0.005$)

N = 112

**Figure 1. Relationships between interpersonal scale "Understanding others Emotions" of EQ and scales of PWB**

Cronbach's alpha values for the Expression Control scale are insufficient, therefore, correlations with this scale are not taken into account.

EQ interpersonal scale "Understanding others Emotions" is positively connected with "Autonomy" ($r$ =.29, $p < 0.005$) and "Personal Growth" (r =.32, p < 0.005).



**Figure 2. Relationships between intrapersonal scale "Understanding own Emotions" of EQ and scales of PWB**

Cronbach's alpha values for the Expression Control scale are insufficient, therefore, correlations with this scale are not taken into account.

Significant positive connection was found between "Understanding own Emotions" and "Positive Relations" (r =.35, p < 0.001), "Autonomy" ($r$ =.34, $p < 0.001$), "Environmental Mastery" ($r$ =.22, $p < 0.05$), "Personal Growth" (r =.27, p < 0.005), "Purpose in Life" ($r$ =.26, $p < 0.005$) and "Self-Acceptance" ($r$ =.19, $p < 0.05$).



**Figure 3. Relationships between interpersonal scale "Managing others Emotions" of EQ and scales of PWB**

Cronbach's alpha values for the Expression Control scale are insufficient, therefore, correlations with this scale are not taken into account.

Also, significant positive connection was found between "Managing others Emotions" and "Positive Relations" ($r$ =.31, $p < 0.005$), "Autonomy", ($r$ =.51, $p < 0.001$), "Environmental Mastery" ($r$ =.22, $p < 0.05$) Personal Growth" ($r$ =.43, $p < 0.001$), "Purpose in Life" ($r$ =.26, $p < 0.01$) and "Self-Acceptance" ($r$ =.22, $p < 0.05$).
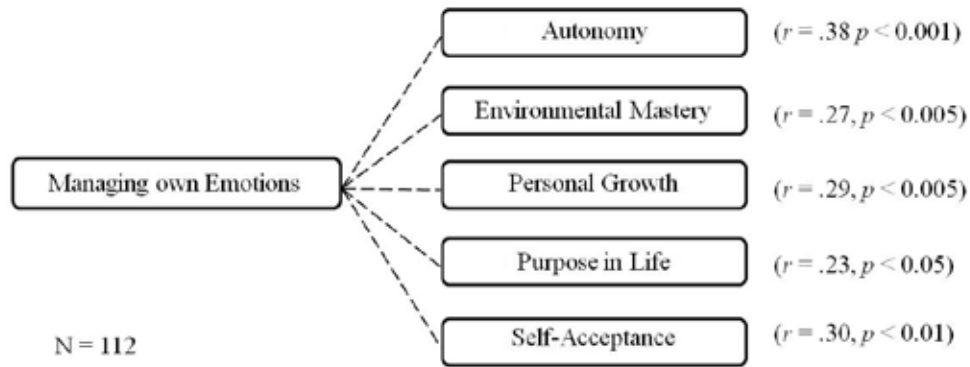
**Figure 4. Relationships between interpersonal scale "Managing own Emotions" of EQ and scales of PWB**

Cronbach's alpha values for the Expression Control scale are insufficient, therefore, correlations with this scale are not taken into account.

"Managing own Emotions" is positively connected with "Autonomy" ($r = .51, p < 0.001$), "Personal Growth" ($r = 0.43, p < 0.001$), "Purpose in Life" ($r = 0.26, p < 0.01$) and "Self-Acceptance" ($r = .22, p < 0.05$).
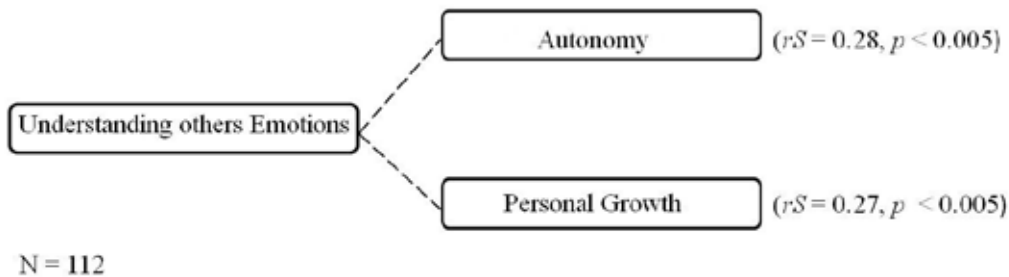


**Figure 5. Relationships between interpersonal scale "Understanding others Emotions" of EQ and scales of PWB**

Cronbach's alpha values for the Expression Control scale are insufficient, therefore, correlations with this scale are not taken into account.

"Understanding others Emotions" is positively connected with "Autonomy" ($rS = 0.28, p < 0.005$) and "Personal Growth" ($rS = 0.27, p < 0.005$).
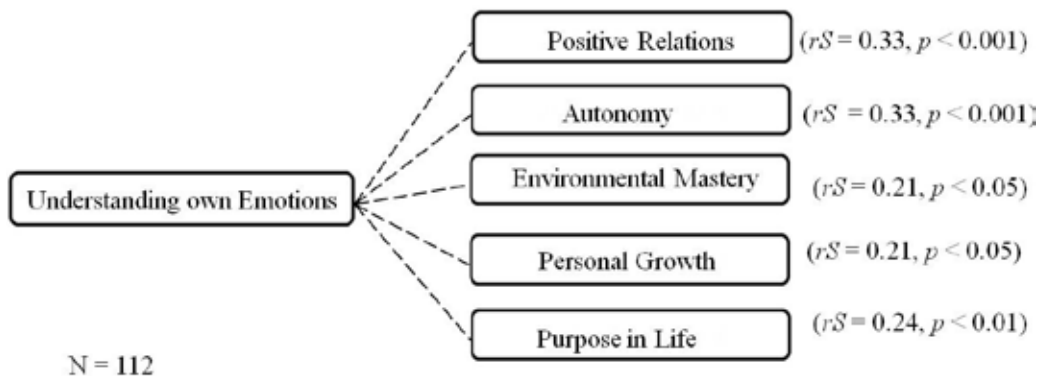


**Figure 6. Relationships between intrapersonal scale "Understanding own Emotions" of EQ and scales of PWB**

Cronbach's alpha values for the Expression Control scale are insufficient, therefore, correlations with this scale are not taken into account.

Significant positive connection was found between "Managing others Emotions" and "Positive Relations" ($rS = 0.25$, $p < 0.01$), "Autonomy", ($rS = 0.46$, $p < 0.001$), Personal Growth" ($rS = 0.38$, $p < 0.001$), "Purpose in Life" $rS = 0.37$, $p < 0.005$) and "Self-Acceptance" ($rS = 0.20$, $p < 0.05$).
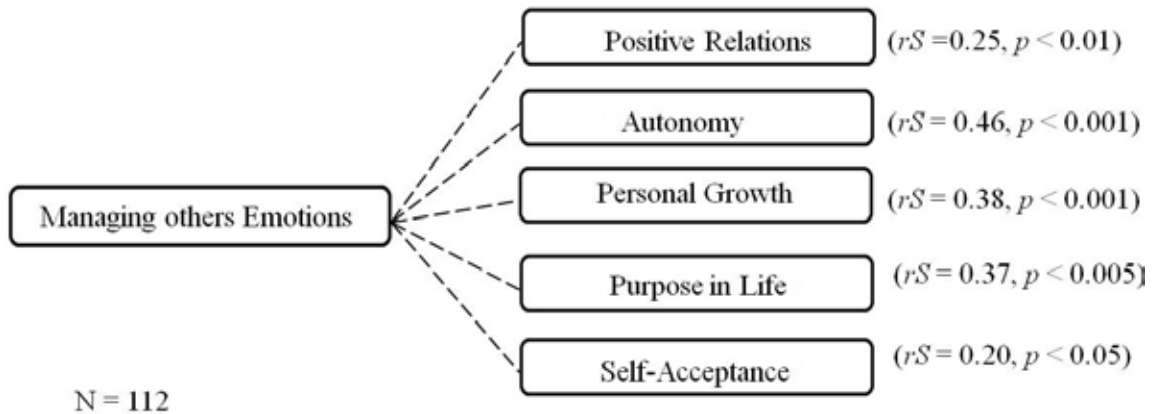


**Figure 7. Relationships between interpersonal scale "Managing others Emotions" of EQ and scales of PWB**

Cronbach's alpha values for the Expression Control scale are insufficient, therefore, correlations with this scale are not taken into account.

Significant positive connection was found between "Understanding own Emotions" and "Positive Relations" ($rS = 0.33$, $p < 0.001$), "Autonomy" ($rS = 0.33$, $p < 0.001$), "Environmental Mastery" ($rS = 0.21$, $p < 0.05$), "Personal Growth" (r = 0.21, p < 0.05) and "Purpose in Life" ($rS = 0.24$, $p < 0.01$).
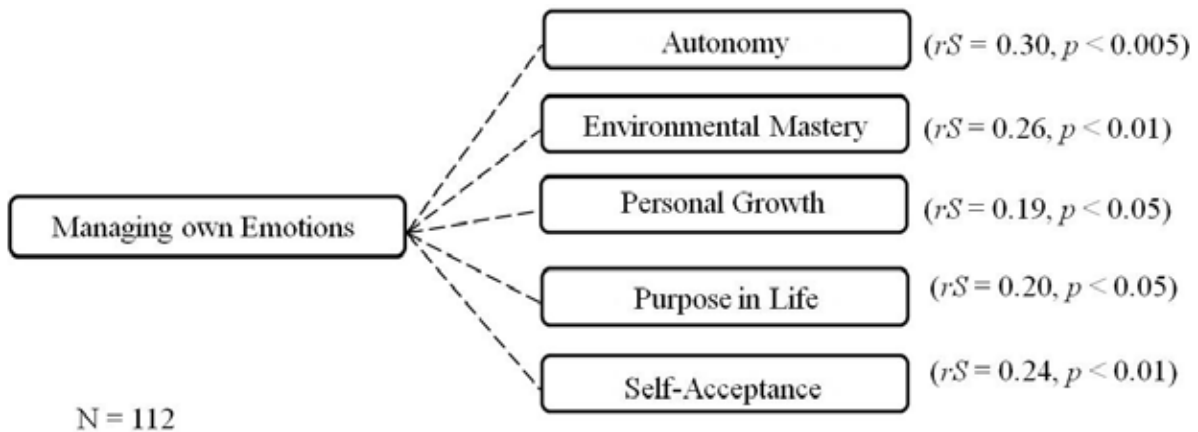


**Figure 8. Relationships between interpersonal scale "Managing own Emotions" of EQ and scales of PWB**

Cronbach's alpha values for the Expression Control scale are insufficient, therefore, correlations with this scale are not taken into account.

Significant positive connection was found between "Managing own Emotions" and "Positive Relations" ($rS = .30$, $p < 0.005$), "Autonomy", ($rS = .26$, $p < 0.01$) Personal Growth" ($rS = .19$, $p < 0.05$), "Purpose in Life" ($rS = .21$, $p < 0.05$) and "Self-Acceptance" ($rS = .24$, $p < 0.01$).

Thus, it was concluded that there is a relationship between emotional intelligence and psychological well-being.

**Discussion.** The purpose of this study was to analyze the relationship between the dimensions of emotional intelligence (understanding other emotions, managing other emotions, understanding own emotions, managing own emotions and expression control) and the dimensions of psychological well-being (positive relationships, autonomy, environment mastery, personal growth, purpose in life and self-acceptance) in a sample of adults aged from 18 to 36 years old.

A detailed analysis of the results demonstrates a clear positive relationship between the components of emotional intelligence and psychological well-being.

In general, these results are consistent with other studies analyzing the relationship between emotional intelligence and happiness (Rey et al., 2005; Acosta et al., 2018) or related variables such as personal and social adaptation (Dawda & Hart, 2000; Ciarrochi et al., 2000; Ciarrochi et al. al., 2001; Palmer et al., 2002; Saklofske et al., 2003; Berrios et al., 2006; Schutte., et al 1998).

Also, the results obtained are consistent with previous studies, in which it was found that self-esteem indicators of EI are associated with eudemonic well-being (Tennant et al., 2007; Raina and Bahshi, 2013), which may indicate that self-esteem of one's EI is associated with the assessment of life as meaningful and pleasant.

Since EI is still a fresh construct, it arouses great interest among proponents of positive psychology in promoting meaningfulness and optimal functioning in the work environment (Bakker and Schaufeli, 2008; Heuvel et al., 2010). It can be said that EI as a contribution to eudemonic well-being deserves attention.

In their study, Heuvel et al. (2010), describing the constantly changing work environment, emphasize the importance of personal competencies, as well as organizational factors that allow employees to be happy, engaged and productive.

The results obtained in the current study indicate that the promotion of the EI trait can serve to enhance the feeling of a meaningful life. Given the current situation after the pandemic, which poses a threat to well-being, including social and economic changes and uncertainty in work, factors related to the meaning of life deserve the attention of researchers and consideration for taking concrete measures to strengthen the mental health of individuals and organizations (Zeidner et al., 2011; Friedman and Kern, 2014; Snyder et al., 2014).

The results in the current work are correlative in nature, and a causal relationship cannot be established, which is a limitation of the study.

Further research is needed to determine exactly how EI can be increased, and whether this can lead to an increase in both hedonistic and eudemonic well-being. Longitudinal studies are also needed to systematically verify the causal mechanisms that contribute to well-being as a result of interference with the level of EI. It is worth saying that well-being is a subjective construct and, therefore, is reasonably assessed using self-report, I would like further research to include more objective indicators of well-being, for example: physical health, academic performance, labor productivity, creative achievements.

Situations that cause a negative reaction are inevitable. Consequently, psychological well-being does not depend on their absence, but on the balance between the amount and intensity of pleasant/unpleasant. Thus, people who pay too little attention to their emotions and understanding of other people's emotions will not experience their inclusion in society, high self-acceptance, autonomy and a sense of personal growth. The regulation of emotional states is necessary for a full life (Guerra-Bustamante, 2019).

Despite the limitations of the study, the results fit into the previous literature, emphasizing the presence of positive links between psychological well-being and emotional intelligence. The study of emotional intelligence is extremely important for positive psychology, because it makes it clear

which constructions are best to pay attention to in order to improve the quality of an individual's life (Seligman and Csikszentmihalyi, 2000).

Directions for the future: It is extremely important to conduct longitudinal studies with a large and diverse time frame, larger samples and different population groups. I also want to note that further research is needed to explore other factors that may affect EI and well-being in terms of the relationships between these variables. Other variables, such as stress levels, depressive states, and self-esteem may also be extremely important for mediating the possible impact of EI on well-being from the point of view of pessimism and optimism, which are important and useful predictors in determining psychological well-being (Ruiz-Aranda, 2013; Scheier, 2001). Despite ongoing research that is vital to support an evidence base important for understanding emotional intelligence, this variable may be the focus of future research aimed at improving psychological well-being among a group of adults.

**Conclusion.** The findings of the study confirm the idea that emotional intelligence and psychological well-being are interrelated. The higher the level of emotional intelligence, the higher the level of psychological well-being, hypothesis is confirmed. More precisely, it showed that as the ability to understand and emotional regulation increases, their subjective well-being, also increases. The important role of emotional regulation should be emphasized, since it is an additional factor related to well-being.

Various approaches to understanding psychological well-being, such as hedonistic and eudemonic, have been studied. Hedonistic well-being has been considered in understanding of N. Bradburn and E. Diener. The eudemonic approach was handled by M. Seligman, R. Ryan and E. Desi, as well as K. Riff, whose questionnaire of psychological well being is taken into methodology of this work.

And also considered a variety of models of emotional intelligence in the understanding of various authors, such as D. Goleman, R. Bar-On, D. V. Lyusin, J. Meyer & P. Saloway.

In this study, an attempt was made to identify specific aspects that should be paid attention to when teaching emotional abilities as a variable that contributes to happiness, emotional well-being and health in people aged 18-36 years.

Insufficient indicators of alpha-Kronbach on the Expression Control scale in the methodology of D. V. Lyusin's emotional intelligence research indicate that the results on this scale may be questionable and it is not worth taking into account their significant correlations with the PWB scales.

The results of the study allow us to see the difference in the relationship between the scales of psychological well-being and emotional intelligence in a group of men and women, their significant difference, against which it would be possible to hypothesize that the same results could be observed with a larger sample.

In conclusion, I want to say that emotional intelligence is a plastic construct, and it is possible to develop and strengthen its ability to understand and regulate emotions, both its own and those around it, which will definitely help to communicate better in society, and therefore increase the level of psychological well-being.

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# STUDY OF THE RELATIONSHIP BETWEEN SELF-ESTEEM AND ACHIEVEMENT MOTIVATION AMONG STUDENTS

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**Abstract**. Goal: to study the relationship between achievement motivation and self-esteem among students. Participants: 72 students aged 17-47 years (Mdn=23). Methods: Rosenberg's self-esteem scale, The Mehrabian Achieving Tendency Scale, State Self-Esteem Scale. Results: strong linear positive relationships were found between achievement motivation and state self-esteem, performance-oriented self-esteem, social self-esteem, global self-esteem. A moderate positive linear relationship was found between achievement motivation and appearance-oriented self-esteem.

**Key words:** achievement motivation, appearance self-esteem, global self-esteem, performance self-esteem, social self-esteem, state self-esteem.

**Introduction.** Highly motivated students are the future resource for the development and progress of a nation. At the same time, Brown and colleagues (1998) point out that motivating students is still a problem because enthusiasm for learning of some students is unpredictable. Students' failures in academic process, as well as misdirected motivation, are largely related to the beliefs that these students form – about their competence, about their physical and intellectual qualities, about their ability to interact with the environment.

These beliefs are related to the construct of self-esteem. In this regard, some researchers suggest that low achievement motivation may be due, among other things, to a factor of low self-esteem (e.g., Manafi et al., 2015; Olaoye & Olaoye, 2018). However, whether there really is a relationship between these two factors as such, and what is the nature of this relationship, is still an open question, although it has been being actively investigated (see, e.g., Ajayi, 2002; Hein & Hagger, 2007; Chen et al, 2018; Arhin & Amoako, 2019). Current study may contribute to this investigation.

Aim of the research: to study the relationship between achievement motivation and self-esteem of students.

Hypothesis: Achievement motivation is related to self-esteem.

**Theoretical basis. Self-Esteem.** According to Plotka and colleagues (2016), among modern theories of self-esteem, 3 main approaches can be distinguished: global self-esteem (self-esteem as a personality trait), state self-esteem (self-esteem as a temporary state) and self-evaluation of domain specific self-esteem (self-esteem as a multidimensional construct based on self-assessment in each specific area) (see, e.g., Fleming & Courtney, 1984; Fox, 2000; Brown & Marshal, 2006; Harris & Orth, 2019).

Global self-esteem. In the 1960s, the sociologist Morris Rosenberg described a peculiar approach to the self-esteem construct, global self-esteem. He considered it as some stable quality inherent in a person, as a relatively stable personality trait. Many researchers today continue to adhere to this view, arguing that global self-esteem develops at an early age and depends on the type of relationship with significant adults (parents, guardians), as well as on innate factors of temperament (Brown et al., 2001).

This approach argues that those feelings of self-attachment that characterize global self-esteem are not based on an assessment of one's qualities and skills in specific areas. Global self-esteem is stable throughout adulthood, with a likely genetic component associated with temperament and neuroticism

(Plotka et al, 2016). Ziegler-Hill and Jordan (2010) also confirm that global self-esteem is usually defined as a general personality trait.

State self-esteem. This approach considers self-esteem as a designation of self-evaluative emotional reactions to valence events. As noted by Plotka and colleagues (2016), many researchers use the term "sense of self-esteem" to describe that emotional state often referred to as "self-esteem", meanwhile "self-esteem trait" referred to how people generally feel about themselves. Other researchers dispute this, arguing that instantaneous emotional responses to positive and negative events do not provide an adequate analog for how people generally feel about themselves. According to them, self-esteem can and should be considered as a "state".

While people may feel good in general, they can sometimes feel insecure about themselves and even dislike themselves. As Kernis (1993) argues, fluctuations in "self-esteem status" are associated with increased sensitivity to and dependence on social evaluations, with increased concern for how one views oneself, and even with anger and hostility. In general, those with fragile self-esteem react extremely favorably to positive feedback and extremely defensive to negative feedback. Heatherton and Polivy (1991) explain that these temporary fluctuations in a person's attitude towards themselves is self-esteem, considered as a state.

Exploring the many factors that can affect one's current self-esteem, Heatherton and Polivy (1991) concluded that personality is characterized by the volatility of current (state) self-esteem, and the overall picture consists mainly of three facets: how well one evaluates own (i) performance and (ii) appearance and how satisfied he/she is with (iii) relationships with other people. This intersects with the ideas of another approach to considering the concept of self-esteem, which suggests that a person builds overall self-esteem on the basis of constant self-assessment in various areas of life.

Self-evaluation – Domain Specific self-esteem. In this approach, self-esteem is seen as the summarized result of how people evaluate their various abilities and qualities in various areas of life. The number of these spheres and their content varies from author to author. Brown and Marshall (2006) prefer to call these beliefs about one's abilities and qualities self-evaluations or self-appraisals because they refer to how people evaluate their physical parameters, intellectual abilities and personality characteristics.

Even Rosenberg and colleagues (1995), speaking about the sustainability of global self-esteem, note that it is impossible to understand the whole picture of an individual's self-esteem, considering only the global component. The authors note that it is also necessary to take into account the specific aspects of self-esteem. These aspects include physical self-esteem, academic self-esteem, social self-esteem, etc. (Marsh & Shavelson, 1985).

Based on the considered abundance of theoretical approaches to the concept of self-esteem, it can be seen that there is no unambiguous interpretation of this concept, as well as its specific content. Self-esteem is appropriate to consider as a stable feature or attitude of an individual towards himself, which manifests itself in a feeling of approval or disapproval of oneself, or as a judgment about one's own worth, which are found in the individual's attitudes. Self-esteem may be stable in its basis, but vary depending on the current state of the individual and the situation. It can also differ in different areas of human life: appearance-oriented self-respect, social self-respect, etc.

Achievement motivation. Similar to the concept of self-esteem, there are several different interpretations of the concept of "achievement motivation". However, unlike the construct of self-esteem, the views of the researchers on the phenomenon of achievement motivation are not so disparate.

According to Murray (1938), achievement motivation is an unconscious impulse to act, an intention to overcome various obstacles on the way to achieving significant heights in any area of life, in order to increase self-esteem. McClelland (1974) described achievement motivation as the desire of an individual to achieve success in various activities. He and Atkinson (1964) laid in this concept two main motives: the need of the individual to achieve success and the need to avoid failure. Researcher Heckhausen (1967)

writes that achievement motivation can be defined as the desire to increase or maintain at the highest possible level one's own abilities in all activities in which some standard of excellence is implied, and where the performance of such actions can, therefore, either be successful, or unsuccessful.

The American Psychological Association Dictionary (APA, 2019) provides the following definitions of achievement motivation:

– the desire to work well and be successful (in this interpretation, this term is often used as a synonym for "need for achievement");

– the desire to overcome difficulties and cope with obstacles that arise on the way.

High personality scores on the achievement motivation factor tend to indicate that he/she will set ever higher standards. Such individuals are more persistent and diligent workers than their equally gifted counterparts, but with lower levels of achievement motivation (APA, 2019).

Elliot and McGregor's (2001) offered achievement motivation model, which suggests two broad classes of goals: mastery achievement ("mastering" a given task or required skills) and performance demonstration (showing superior performance compared to others).

As Pintrich and Schank (2002) point out, various theories of motivation focus on explaining goal-related activity. Many early theories of motivation explained this activity in terms of drives, instincts, and other intrinsic traits. Some theories explain motivation in terms of behavioral associations associated with random rewards (Pintrich & Schunk, 2002). The authors also write that modern theories of motivation focus more on social-cognitive processes. This view is represented in motivation attribution theory, which links achievement striving to how people interpret their successes and failures in achievement situations (Weiner, 1979). Expectancy-value theory links achievement motivation to individual expectations and the subjective perception of the value of those expectations (Eccles, 1983; Wigfield & Eccles, 2000).

As in the case of self-esteem, some researchers believe that achievement motivation is situational and also multidimensional. The level of individual motivation can vary from area to area (for example, high career achievement motivation, but low financial achievement motivation), as well as depending on the situation, with the influence of other factors (Cassidy & Lynn, 1989). Current study considers general achievement motivation of a person.

**Analysis of Empirical Research on the Relationship Between Achievement Motivation and Self-Esteem.** In recent years, there has been a growing interest in the study of personal resources (cognitive, affective, emotional, etc.) that contribute to the successful adaptation and positive development of young people in an academic environment, despite the difficulties they may encounter (Chen et al., 2018). One of the most prominent approaches to studying goals in an academic context is Elliot and McGregor's (2001) theory that the motivation and intentions that guide students in learning are at the heart of their success. Studies of samples of university students based on explicit methods show that self-esteem is positively associated with achievement motivation and negatively associated with failure avoidance motivation (Chen et al., 2018; Shim et al., 2012).

In her study of female college students in Nigeria, Ajayi (2002) found results that showed a statistically significant relationship between achievement motivation and self-esteem among the subjects.

Baumeister and colleagues (2003) found that high levels of self-esteem are an important predictor of good student performance. Exploring the concept of self-esteem in terms of an individual's physical health, Fox (2000) concluded that high self-esteem scores are associated with choices, persistence, and achievement in a wide range of healthy lifestyle behaviors. He found that people who are motivated to eat healthy and who believe they can stick to a regular exercise schedule have higher levels of self-esteem.

Hein and Hagger (2007) suggested that the presence of autonomous personal motives (particularly in the context of physical activity) increases an individual's overall achievement motivation, which in turn has an effect on global self-esteem.

Arhin and Amoako (2019) investigated the relationship between self-esteem and student academic achievement using a correlation design on 162 preselected university students. The results revealed a strong positive relationship between subjects' academic performance and global self-esteem.

Manafi, Movahed and Hejazi (2016) explored the role of self-esteem in motivating students to achieve. ANOVA results showed significant differences between students depending on their level of self-esteem and achievement motivation. The results of the regression analysis showed that the level of self-esteem predetermines the motivation of students to achieve.

Zoabi (2012) investigated the relationship between self-esteem and motivation to learn among students. The results showed a positive relationship between self-esteem and motivation to learn. Odam-Mensah (2019) showed in his study that self-esteem largely predicts achievement motivation. Current research is an addition to the list of the mentioned studies of the relationship between self-esteem and achievement motivation constructs.

Method. Participants. The study involved 72 females, Russian-speaking students of higher education facilities in various countries, aged 17-47 years (Mdn = 23, M=26, SD=7,90).

Measures. Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is a concise, simple, and convenient way to measure global self-esteem. According to Rosenberg (1965), self-esteem is a person's positive or negative attitude towards himself and the evaluation of his own thoughts and feelings in general in relation to himself. High scores indicate a high level of global self-esteem, low scores indicate a person's low global self-esteem.

State Self-Esteem Scale (SSES; Heatherton&Polivy, 1991) Heatherton and Polivy (1991) note that there are 3 interrelated factors in this scale. (1) Performance Self-esteem – people with a high level of this component of self-esteem feel confident in their intelligence and abilities. (2) Social Self-esteem – if a person is confident that others, especially significant others, appreciate and respect him, the indicator of social self-esteem will be high. (3) Appearance Self-esteem refers to how a person considers their inherent physical characteristics, which include athletic skills, physical attractiveness, the presence or absence of any physical defect, and also reflects attitudes towards a sense of race and ethnicity. High and low scores indicate high and low appearance self-esteem, respectively.

The Mehrabian Achieving Tendency Scale (MATS; Mehrabian, 1968) allows to identify two opposing aspirations of the individual – to achieve success and avoid failure. High total scores indicate the dominance of the desire for success. Low scores indicate the low motivation of the individual in achievements, expressed in the desire to avoid failures.

**Results.**

1. General state self-esteem has a strong positive relationship with achievement motivation $rS(72) =.63$, $p <.001$, large effect size.

2. Performance self-esteem has a strong positive relationship with achievement motivation $rS(72) =.51$, $p <.001$, large effect size.

3. Social self-esteem has a strong positive statistically significant relationship with achievement motivation $rS(72) =.66$, $p <.001$, large effect size.

4. Appearance self-esteem has a moderate positive statistically significant relationship with achievement motivation $rS(72) =.49$, $p <.001$, mean effect size.

5. Global self-esteem has a strong positive statistically significant relationship with achievement motivation $rS(72) =.54$, $p <.001$, large effect size.

Thus, it was found that with an increase in achievement motivation, following indicators also increase:
• global self-esteem;
• state self- esteem;
• performance self-esteem;
• social self- esteem;
• appearance self-esteem.

That is, the more the subjects strive to achieve success, the more they will be inclined to evaluate themselves as internally positive, to have greater confidence in individual worth and an adequate assessment of their strengths and weaknesses, and vice versa. They will also to a greater extent maintain self-esteem even when failing.

In addition, the more they strive to achieve success, the more they feel confident in their intelligence, personal abilities, and that others, especially significant others, appreciate and respect them. At the same time, the opposite is also true: the higher the indicators of self-esteem (global, state and its types), the higher the motivation for the individual's achievements.

**Discussion.** These results confirm the findings of previous studies (e.g., Ajayi, 2002; Chen et al., 2011; Arhin & Amoako, 2019). In particular, the strong relationship found between achievement motivation and global self-esteem is consistent with the findings of a study by Hein and Hagger (2007). The authors hypothesized that the presence of autonomous personal motives (particularly in the context of physical activity) increases an individual's overall achievement motivation, which in turn has an effect on global self-esteem.

Ajayi (2002) suggests that the relationship between self-esteem and achievement motivation is causal, and that the level of achievement will depend precisely on the results of evaluation or judgments of self-worth. Chen and colleagues (2018) argue that in order to increase the level of achievement of students, to reduce their self-restraint from achieving meaningful results, it is necessary to increase their self-esteem.

The way in which achievement motivation increases with an increase in actual self-esteem has also been noted before (e.g. Zoabi, 2012; Nwankwo et al., 2013). The results obtained in this study indicate the same: if the individual's current self-esteem grows, his desire for achievement will also become stronger. This means that students who score higher on self-esteem scales will also tend to show a stronger need for achievement in and outside of academic life.

The regression analysis conducted by Zoabi (2012) showed that achievement motivation among students is determined by the level of their self-esteem. The results of the study are consistent with the findings of Manafi, Mowahhed and Hijazi (2015), who also found that self-esteem predicts student achievement motivation. Similar results confirming a strong relationship between achievement motivation and self-esteem in students have been obtained by other researchers whose samples consisted of representatives of different cultures (e.g. Ajayi, 2002; Shim et al., 2012; Odame-Mensah 2019).

The study was conducted on a target sample (72 people), which calls into question the relevance of applying its results in relation to the general mass of students. When forming the sample, the cultural factor was also not taken into account (only Russian-speaking students took part), although similar results obtained by other researchers on representatives of various language groups and countries indicate that the relationship between achievement motivation and self-esteem most likely exists regardless from the cultural aspect. However, this assumption may be premature and requires further verification. In view of the above-mentioned limitations that arose during the conduct of this study, several recommendations for further work can be put forward. The first and necessary action is to increase the sample of follow-up studies. It is also possible to involve implicit methods for a deeper analysis of the relationship between constructs.

Dividing the sample by age groups, by stages of the learning process (for example, 1st year, graduate, undergraduate; beginning of the semester, exams, etc.), by marital status, work experience and other indicators is also a prospect for further studying the relationship between achievement motivation and self-esteem. Such a "narrowing" of the field of study, specification of the parameters of the sample, can turn the existing results upside down.

The sample size also does not allow obtaining reliable results from a more detailed study of the relationship found (for example, when dividing the sample according to the leading motive of achievements or according to the level of self-esteem).

Another vector for the development of this topic may be the use of methods that consider other subscales of constructs. Most of the research conducted to date on these constructs to collect data on self-esteem uses the Rosenberg Self-Esteem Scale, which reflects only global self-esteem. However, the technique of the Scale of State Self-Esteem allows you to obtain data on the "subtypes" of current self-esteem. A good link between these methods could be the Self-Esteem Stability Scale (Chabrol et al., 2006).

**Conclusion.** An analysis of the concept of self-esteem showed that there is no unambiguous interpretation of this concept, as well as its specific content. Self-esteem is appropriate to consider as a stable feature or attitude of an individual towards himself/herself, which manifests itself in a feeling of approval or disapproval of oneself, or as a judgment about one's own worth, which are found in the individual's attitudes. However, in addition to a global, stable construct, it is also advisable to consider self-esteem as a changeable state, denoting a person's self-evaluative emotional reactions to valence events.

Concerning the content of the concept of self-esteem, there are two provisions that are accepted by most researchers: self-esteemn is a generalized self-attitude, which, firstly, is a holistic, one-dimensional and universal formation that expresses the degree of positive attitude of an individual to his own self-image; secondly, it integrates with individual subscales.

According to a study conducted by Plotka and colleagues (2016), among modern theories of self-esteem, 3 main approaches can be distinguished: global self-esteem (self-esteem as a personality trait), state self-esteem (self-esteem as a temporary, current state) and self-evaluation of domain specific self-esteem (self-esteem as a multidimensional construct based on self-assessment in each specific area).

The construct of achievement motivation has been found to be the desire to work well and be successful, as well as the desire to overcome difficulties and cope with obstacles that arise along the way (APA, 2019).

The main theories of achievement motivation are: the theory of McClelland (1987), in which motivation is based on the human need for achievement, power and belonging; Atkinson's theory (1964), according to which everyone is driven by two motives: achieving success and avoiding failure; Elliot and McGregor's (2001) achievement motivation model with its two classes of goals: to master one's skills and/or to demonstrate one's performance.

Key empirical studies on the relationship between achievement motivation and self-esteem were analyzed (e.g., Ajayi, 2002; Hein & Hagger, 2007; Chen et al., 2011; Arhin & Amoako, 2019). These studies have indicated that there is a relationship between achievement motivation and self-esteem, this relationship is observed in representatives of different cultures, both sexes.

Current study confirms the previously identified links between the constructs under study and complements the overall picture of its understanding. As a result of the empirical research, the following conclusions were obtained:

A strong positive relationship was found between global self-esteem/state self-esteem (performance and social) and achievement motivation. A moderate positive relationship was found between achievement motivation and state self-esteem focused on appearance. The higher the students' self-esteem, the higher their motivation to achieve, and vice versa.

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"Baltic Journal of Legal and Social Sciences"  publishes articles in English. The theme of the article should be disclosed in a clear, logical and well reasoned way.

The requirements to the structure and the layout of articles are the following:

• The size of the submitted article, including the bibliography, should be within 20,000-50,000 characters with spaces. The article is presented in Microsoft Word, paper size – A4, margins along the edges of the page – 20 mm on each side.

• The text of the article: font Times New Roman; font size 12 pt; line spacing 1,5, the first line of each paragraph with indentation 1.5 mm.

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1. the title of the article is written in capital letters (font Times New Roman, font size 12 pt, Bold, Center);

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