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Correlations between Intellectual Abilities and Features of the Motivational-Emotional Sphere in College-Age Boys and Girls

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The research is aimed at clarifying and comparing the specifics of the correlations between intellectual abilities, manifestations of emotions and motives in boys and girls of student age. In the process of theoretical analysis, the researchers' points of view on the nature of intellectual abilities are compared, interpretations of the essential characteristics of the motivational and emotional sphere manifested in various spheres of life are presented. It is shown that the productivity of the intellectual abilities of the individual is conditioned by the prevailing motives and the degree of severity of emotional states. 105 individuals took part in the study: 40 female and 65 male students of the Siberian Polytechnicnical College at the age of 17—20 years. Various statistical methods were used to process the data. Correlation analysis allowed to reveal the correlations between the studied characteristics both in the whole sample and separately for male and female parts of it. In the total sample, an inverse correlation was found between respondents' assessment of their well-being and their performance in solving tasks, which is explained by the need for conscious regulation of intellectual activity. This correlation is most vividly manifested in the subtests on practical ability plans, in which the use of verbal-logical thinking and the synthetic act of correlating the task condition and actualization of the necessary knowledge are assumed. Statistically significant differences were found in the two-factor analysis of variance. On average, girls have a higher motivation to achieve success, more often conditioned by external factors. They are also more sensitive to the influence of mental adaptation processes on the productivity of thought operations. Young men, as a rule, have a higher subjective assessment of anxiety and a lower level of motivation to achieve success, which, however, does not significantly affect the results of their mental activity. In addition, the sample of young men has a

higher level of mental stress, as focusing on the problem-solving process may require more cognitive resources.

Keywords: cognitive processes; intellectual abilities; motivational-emotional sphere; psychometric intelligence; gender differences.

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Взаимосвязь интеллектуальных способностей и мотивационно-эмоциональной сферы у юношей и девушек студенческого возраста

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Представлены результаты исследования, направленного на установление специфики взаимосвязи между интеллектуальными способностями, проявлениями эмоций и мотивов у юношей и девушек студенческого возраста. Сопоставлены точки зрения исследователей на природу интеллектуальных способностей, интерпретации сущностных характеристик мотивационно-эмоциональной сферы, проявляющихся в различных сферах жизнедеятельности. Показана обусловленность продуктивности интеллектуальных способностей личности преобладающими мотивами и степенью выраженности эмоциональных состояний. В исследовании приняли участие 105 испытуемых: 40 девушек и 65 юношей в возрасте 17—20 лет, обучающихся в Сибирском политехническом техникуме. Для обработки полученных данных использовались различные статистические методы.

Корреляционный анализ позволил выявить ряд зависимостей между исследуемыми характеристиками как во всей выборке, так и отдельно по мужской и женской ее частям. На общей выборке была обнаружена обратная корреляция между оценкой респондентами самочувствия и результативностью решения ими задач, что объясняется необходимостью осознаваемой регуляции интеллектуальной деятельности. Наиболее выраженно эта связь проявляется в субтестах на практические планы способностей, в которых предполагается использование словесно-логического мышления и синтетический акт соотнесения условия задачи и актуализации необходимых знаний. В ходе двухфакторного дисперсионного анализа были обнаружены статистически значимые различия. В среднем девушки обладают более высокой мотивацией к достижению успеха, причем чаще обусловленной внешними факторами. Также они более чувствительны к влиянию процессов психической адаптации на продуктивность выполнения мыслительных операций. У юношей же, как правило, наблюдаются более высокая субъективная оценка тревожности и более низкий уровень мотивации достижения успеха, что, однако, не оказывает значимого влияния на результаты их умственной деятельности. Помимо этого, для выборки юношей отмечается более высокий уровень психического напряжения, так как сосредоточение на процессе решения проблем может требовать большего количества когнитивных ресурсов.

Ключевые слова: когнитивные процессы; интеллектуальные способности; мотивационно-эмоциональная сфера; психометрический интеллект; гендерные различия.

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Introduction

In contemporary psychological research, increasing attention is being devoted to exploring the relationship between intellectual abilities and motivational-emotional characteristics in young people, particularly among students. Advances in psychology and pedagogy provide deeper insight into the differences and similarities between intellectual and emotional domains in young men and women as they transition into adulthood.

From our perspective, the level-based characteristics of intellectual abilities and the manifestations of the motivational-emotional domain may be influenced by gender. This may be attributed to differences in learning approaches, attitudes toward success and failure, and distinct strategies for self-regulation and motivation between young men and women.

This assumption is supported by an analysis of the study conducted by L. Keller et al. [24], which examined gender differences in the academic performance of students in technical fields. By analyzing empirical data from individual participants,

the study investigated the influence of sociocultural factors on academic achievement and motivation.

The study by R.M. Abdelrahman [17] investigated the impact of metacognitive processes on academic performance, as well as the relationship between learning motivation and academic outcomes among male and female students. Additionally, I.S. Morozova and colleagues [8] examined students' decision-making processes in selecting individualized educational trajectories.

Our systematic review has identified common patterns and contributed to the development of new hypotheses and practical recommendations based on prior research. For example, the study by L. Keller et al. [24] explored gender differences in the academic performance of students in technical disciplines. By analyzing empirical data from individual participants, the research assessed the influence of sociocultural factors on academic achievement and motivation.

E.I. Perikova and colleagues [10] explored students' self-regulation strategies as an expression of their internal resources, which contribute to their overall satisfaction, motivation, and effectiveness in academic activities. N.P. Shilova [15] highlighted the importance of considering students' perceptions of their transition into adulthood during this developmental stage.

Academic motivation is a multifaceted construct that encompasses not only motives but also goals, response strategies, and persistence. In a meta-analysis, N. Sölpük Turhan [31] examined the influence of gender on academic motivation and assesses the strength of this effect. The findings enabled the author to identify dominant types and levels of academic motivation among students, as well as to evaluate the extent to which gender differences shape its components.

The theoretical model proposed by M. Pelch [28] explored the relationships between student anxiety, attitudes toward the learning process, self-regulated learning, and academic performance. The study highlighted significant gender differences in the structure of emotional states. Gender-related variations in students' self-perception, influenced by various sociocultural factors, are also emphasized in a large-scale study by A.M. Mej a-Rodr guez et al. [27]. Their analysis revealed that these differences remain significant even when controlling for academic achievement and parental involvement.

The interplay between students' motivation levels and emotional states has been widely investigated. For example, M.C. Florescu [21] identified a negative correlation between intrinsic academic motivation and dysfunctional emotions. Similarly, M. Shin et al. [30] demonstrated that intellectually stimulating teaching behaviors positively influence the educational process by fostering students' intrinsic motivation, increasing engagement, and enhancing their sense of self-efficacy. The critical role of perceived self-efficacy is also underscored in the work of C. Voica [33], which examines the impact of affective states on cognitive processes related to goal setting and problem-solving.

This study explores theoretical approaches to the examination of intellectual abilities and the motivational-emotional sphere of personality, with consideration of gender differences. It also presents empirical findings assessing the strength of associations between these constructs and identifying significant differences between male and female university students. The primary objective was to investigate the specific interplay between intellectual abilities, emotional expressions, and motivational factors in students. The study tested

the hypothesis that intellectual abilities, motivations, emotions, and gender identity are interconnected among university students.

Intellectual Abilities

The construction of a holistic understanding of intellectual abilities is based on the analysis of key theories. Notably, in Lev Vygotsky's sociocultural theory, the role of social interaction and cultural context in shaping cognitive development is emphasized [2]. In this framework, the concept of the Zone of Proximal Development (ZPD), which refers to the gap between what a learner can do independently and what they can achieve with the assistance of a more knowledgeable peer or adult, is introduced. According to this theory, learning is a social process, and interaction with others plays a crucial role in cognitive development. Collaborative educational activities, such as group projects, discussions, and peer teaching, can help students enhance their intellectual abilities by engaging in shared problem-solving and knowledge construction. Vygotsky's theory also highlights the impact of the cultural context on cognitive development. By considering the cultural background, experiences, and social context of students, as well as identifying and targeting the ZPD, educators can create an inclusive learning environment that takes into account cultural differences and fosters intellectual growth.

Jean Piaget's operational theory of intelligence outlines the stages of cognitive development that children go through: sensorimotor, preoperational, concrete operational, and formal operational stages [19]. According to Piaget's theory, the human organism exerts effort to adapt to disruptions in the equilibrium between the environment and the organism itself, with intelligence being the perfect tool for achieving this balance and optimal functioning. The central idea of Piaget's theory is the necessity of interaction with objects for their understanding. He emphasized the need for an exploratory component in the learning process, as intelligence grows through two complementary processes — assimilation (the organism's response to the environment) and accommodation (the impact of the environment on the organism).

R.J. Sternberg was among the first scholars to adopt a cognitive approach to intelligence, as opposed to the psychometric perspective, and developed the triarchic theory of intelligence [32]. According to his definition, "intelligence is mental activity aimed at adapting to, selecting, and shaping the real-world environment in a manner that is relevant to an individual's life." Sternberg links cognitive activity to a set of components, which include performance components, knowledge-acquisition components, and metacomponents — executive processes utilized in problem-solving and decision-making. These components are interdependent; all contribute to the problem-solving process, and none can function in isolation. However, Sternberg further clarifies that different contexts and tasks require the application of distinct types of intelligence, leading to the development of several subtheories:

1. Componential — analytical subtheory. This aspect of intelligence is focused on cognitive abilities related to academic performance, including the capacity to analyze, evaluate, and critically assess information. Individuals with high analytical intelligence excel in tasks that demand logical reasoning, critical thinking, and problem-solving skills.

2. Experiential — creative subtheory. This aspect emphasizes cognitive processes related to creativity and innovation. It involves the ability to generate novel ideas and adopt unconventional approaches to

problem-solving. Individuals with high creative intelligence are adept at thinking divergently, proposing original solutions, and recognizing connections between seemingly unrelated concepts.

3. Practical — contextual subtheory. This subtheory addresses the cognitive processes involved in adapting to and effectively navigating real-world environments. It encompasses the ability to apply knowledge and skills in practical contexts, such as work settings or everyday life. Individuals with high practical intelligence are skilled at applying their cognitive abilities to solve real-world problems and achieve success in everyday tasks.

The Triarchic Theory of Intelligence by R.J. Sternberg can be applied to the intellectual abilities of students, recognizing that individuals may excel in different areas. According to this theory, intelligence extends beyond traditional measures, such as IQ, and also encompasses practical, creative, and analytical abilities. Furthermore, many individuals may integrate all three types of intelligence, demonstrating high proficiency in each.

Current research on intellectual abilities focuses on understanding their role in cognitive activities [1] and their relationship with manifestations of giftedness [7]. It is crucial to note that intellectual abilities are influenced not only by cognitive processes but also by the emotional and motivational components of personality. Emotions can shape cognitive functions such as decision-making, memory, and problem-solving, while cognitive processes can, in turn, impact emotional experiences.

Motivational and Emotional Domain

J.P. Forgas developed the Affect Infusion Model (AIM), which posits that the influence of an individual's emotional state on cognitive processes is contingent upon the specific information processing strategy employed [22].

The selection of one of four possible strategies is determined by two key parameters. The first parameter concerns the amount of effort exerted during information processing, whereas the second refers to the productive nature of the activity, which involves generating new information. Conversely, unproductive activities are characterized by situations in which adherence to a predetermined problem-solving algorithm is required.

The likelihood of affect influencing cognitive processes is low when employing direct access or goal-directed (motivated) processing strategies. The direct access strategy is characterized by low task productivity and minimal cognitive effort, meaning that mood is unlikely to significantly impact task performance. By contrast, the goal-directed (motivated) processing strategy requires slightly more cognitive effort due to the need to achieve a specific goal.

The probability of affect influencing cognitive processes increases when utilizing the heuristic processing strategy. This strategy involves more productive activity with relatively low cognitive effort and is typically applied when motivation is low, or when the individual has little interest in the task, as well as when there is a high cognitive load due to attentional or working memory demands.

The substantive processing strategy, which necessitates both high productivity and significant effort, is used when addressing complex, large-scale tasks that lack clear or unambiguous solutions. In these cases, the individual must set their own goals and monitor their progress. The likelihood of affect influencing cognitive processes is highest in this context.

R. Lazarus' cognitive appraisal theory suggests that emotions are a result of how

an individual evaluates a situation or event [25]. This appraisal involves two key components: the interpretation of stressors (the individual evaluates the significance of an event for their well-being) and the assessment of available resources (where the individual appraises their capacity to manage the situation). Cognitive appraisal occurs rapidly and automatically. Based on the outcomes of these evaluations, individuals experience a range of emotions.

Three types of primary appraisal are identified: favorable, irrelevant, and stressful. A favorable primary appraisal occurs when the expected outcome of the event is perceived as beneficial. If, however, a stressful event is deemed significant, and the individual believes they lack the resources to cope with it, they may experience anxiety or fear. Conversely, if the event is perceived as inconsequential, or if the individual feels equipped with the necessary resources, they may experience little to no negative emotions.

Furthermore, according to the theory, secondary appraisal is subdivided into components such as the potential for acceptance, the possibility of altering the situation, the prediction of its development, and the explanation of the locus of control.

Cognitive appraisal can be influenced by a variety of factors, including personality traits, social context, and situational elements. According to this theory, individuals with higher intellectual abilities generally experience more intense emotions compared to those with lower intellectual abilities.

This theory is supported by research conducted by J.J. Gross, which showed that individuals with higher intellectual abilities tend to experience both more intense positive and negative emotions. However, they are also more capable of effectively regulating these emotions [23].

L.F. Barrett's theory of emotion construction suggests that emotions are generated by the brain through a combination of sensory input, past experiences, learned concepts, and cultural context, contrasting with the classical view of emotions as preprogrammed states with distinct neural signatures [18]. This theory supports a multidimensional perspective on emotions, where emotions are not discrete categories but rather exist along a continuum of affective experiences. This perspective allows for a more nuanced understanding of emotional variability — the process is dynamic and flexible, enabling the experience of a broad range of emotional states.

According to this theory, emotions are seen as a form of categorization. The brain processes sensory information and assigns meaning, which may vary depending on the individual and context. The same sensory input can trigger different emotional responses because individuals rely on past experiences and learned concepts to predict and construct emotional reactions to incoming stimuli. Additionally, the formation and expression of emotions emphasize the influence of environmental cues, social interactions, and situational factors.

In relation to the connection between emotions and motivation, L.F. Barrett suggests that emotions are not merely passive responses to stimuli but are actively constructed by the brain to help individuals navigate their environment and achieve their objectives. Emotions act as signals that guide behavior and decision-making, influencing the choices people make to fulfill their needs and desires. For instance, fear may prompt an individual to avoid a potentially harmful situation, whereas joy may encourage social bonding and collaboration. In this sense, motivation plays a role in shaping how emotions are generated in response to particular situations.

A person's goals, values, and priorities impact the emotions that arise and how they are experienced.

Furthermore, within the framework of Barrett's emotion construction theory, intelligence encompasses not only cognitive abilities but also emotional intelligence — the ability to perceive, understand, and effectively regulate emotions. Intelligence is viewed not as separate from emotions but rather as an intricate interaction between cognitive processes and emotional experiences. Emotions can either facilitate or hinder cognitive functioning, depending on how they are constructed and regulated in a given context. Emotional intelligence allows individuals to harness their emotions as valuable sources of information, guiding their thoughts and actions.

In general, according to L.F. Barrett's theory, emotions, motivation, and intelligence represent intertwined dimensions of human experience that dynamically interact, guiding behavior, cognition, and social interactions. Emotions influence motivation by signaling the significance of particular goals and outcomes. Motivation, in turn, shapes the way emotions are constructed and expressed in response to various stimuli. Intelligence, including emotional intelligence, plays a pivotal role in how individuals regulate their emotions, make adaptive decisions based on emotional cues, and effectively navigate social interactions. Understanding the intricate interactions among these elements can offer valuable insights into how individuals perceive and respond to their environments.

Gender Differences

Gender differences in students' intellectual abilities are an active area of psychological research. We believe that men and women may demonstrate differences in their intellectual abilities, which can significantly influence their academic performance and professional achievements. These differences may stem from variations in brain structure and hormonal background, shaped by neurobiological mechanisms, as well as differences in social roles and the experiences men and women acquire in society.

One of the most extensively studied aspects of gender differences in intellectual abilities is spatial intelligence. Research indicates that men generally demonstrate higher proficiency in this domain, which involves the ability to perceive, manipulate, and mentally transform spatial representations [24].

Conversely, verbal intelligence is another area where gender differences have been observed. Empirical studies suggest that women typically exhibit greater proficiency in verbal intelligence, encompassing language comprehension, linguistic expression, and the ability to analyze and interpret textual information.

It is important to emphasize that gender differences in intellectual abilities are not absolute; rather, they are influenced by a complex interplay of cultural, social, and educational factors.

Gender differences among students are also observed in the emotional and motivational domains. Men and women may differ in their emotional responses and motivational tendencies, which can have a significant impact on their academic performance and professional development.

One of the most well-documented aspects of gender differences in the emotional-motivational sphere is emotional sensitivity [31]. Studies suggest that women generally exhibit higher emotional sensitivity and expressiveness, displaying a broader range of emotions compared to men. Additionally, women tend to be more receptive to emotional stimuli and are more prone to heightened emotional reactions.

Motivation is another domain in which gender differences may be observed [15]. Research suggests that women are generally more motivated by social relationships, whereas men tend to prioritize career advancement and financial success. These differences may be shaped by societal expectations, stereotypical gender roles, and distinct social experiences of men and women.

It is essential to acknowledge that gender differences in intellectual abilities and emotional-motivational characteristics are not the sole or primary determinants of academic achievement or professional success. Individual factors, such as intrinsic interest, perseverance, and social or environmental support, also play a critical role in determining outcomes.

The results of this theoretical analysis provided the basis for an empirical study examining the expression of intellectual abilities, emotional responses, and motivational factors among male and female students.

Methods and Materials

The study was conducted at the Siberian Polytechnic College and included 105 students aged 17—20 years (40 female and 65 male participants). Data collection was carried out using survey-based methods.

To evaluate the level and structure of intellectual abilities, the Intelligence Structure Test (IST) by R. Amthauer (adapted by K.M. Gurevich, M.K. Akimova, et al.) [12] was administered. This assessment measured verbal, mathematical, spatial, and mnemonic abilities. The obtained results were also used to calculate participants' IQ scores based on normative tables.

To assess two fundamental and stable personality motives, the "Achievement Motivation" and "Failure Avoidance Motivation" questionnaires by T. Ehlers [11] were administered.

The Motivational Structure Test by F. Herzberg was also utilized to examine the structure of students' motivation and identify key factors influencing their satisfaction or dissatisfaction with academic activities. According to Herzberg's theory, motivation is driven by two categories of factors: motivational (intrinsic) factors and hygienic (extrinsic) factors [14]. Hygienic factors include social recognition, financial incentives, and interpersonal relationships, while motivational factors encompass opportunities for career growth, personal achievement, and the intrinsic value of academic work.

To further explore students' motivational characteristics, the "Motivation for Studying at a University" method by T.I. Ilyina was applied. A predominance of motivation for acquiring knowledge and mastering a profession over the motivation for obtaining a diploma is indicative of an appropriate career choice and a high level of satisfaction with one's field of study [5]. Additionally, the "Participation Motivation Structure" method was used to assess the underlying motives for students' participation in the study [4].

A comprehensive assessment of respondents' emotional states was conducted using various psychological methods. Neuropsychic tension test by T.A. Nemchin was employed to identify excessive strain on the body's regulatory system [9].

The "Well-being — Activity — Mood" questionnaire and the "Subjective Assessment of Current Mental States" were used to evaluate respondents' psychological state, their psycho-emotional response to stress, and individual characteristics of psychophysiological functions [3].

Well-being can be understood as a generalized characteristic (e.g., vigor, malaise) or as a more localized sensation related to specific physical discomfort in different areas of the body.

Activity reflects an aspect of temperament and is determined by the intensity and scope of an individual's interactions with both the physical and social environment. Based on this parameter, individuals can be categorized as inert, passive, calm, proactive, active, or highly energetic.

Mood is considered a relatively prolonged and stable emotional state, which can manifest either as a general emotional background or as a clearly identifiable condition. Although mood is often triggered by specific causes, it also influences an individual's overall emotional responsiveness to various stimuli.

The Clinical Questionnaire for the Detection and Assessment of Neurotic States was used to conduct a qualitative analysis of neurotic symptoms across six diagnostic scales: anxiety, neurotic depression, asthenia, hysterical response patterns, obsessive-phobic disturbances, and autonomic dysfunction [16].

Additionally, the "Determination of dominant mental state" technique, developed by L.V. Kulikov, was employed to identify relatively stable personality characteristics based on respondents' subjective evaluations. In this study, a brief version of the method was used, with core scales assessing engagement with life situations, emotional tone, generalized anxiety levels, emotional stability, life satisfaction, as well as self-evaluation accuracy and critical thinking [6].

Data were processed using the statistical software package Statistica 10. To identify differences in mean values, Student's *t*-test and analysis of variance (ANOVA) were applied. Percentages were compared using Fisher's Angular Transformation test. Pearson's correlation coefficient was used to assess the relationship between variables. The critical value for statistical significance in testing null hypotheses was set at $p < 0.05$. The data collected during the study are available in the RusPsyData repository of psychological research and tools at the Moscow State University of Psychology and Education [13].

Analysis and Discussion

Table 1 presents descriptive statistics for the structural components of intelligence, calculated for the sample of male and female participants. No significant differences were found in the mean values of the structural components between these groups.

The distribution of male and female participants according to the classification of

Table 1

Descriptive Statistics of Structural Components of Intelligence in Female and Male Groups

	Mean		Median		Standard Deviation	
	females	males	females	males	females	males
Verbal Abilities	57.18	56.03	55.5	54	18.08	13.81
Mathematical Abilities	28.88	30.15	29.0	33	8.32	8.47
Constructive Abilities	24.40	28.06	25.5	29	10.56	11.47
Mnemonic Abilities	17.23	16.34	18	19	3.12	5.43
Abstract Thinking Abilities	31.57	30.12	29.5	28	12.37	9.54
Analytical Abilities	25.60	25.91	24.5	26	7.05	5.62
Overall IST Score	118.03	121.94	119.0	126	27.85	26.58
IQ	118.00	119.48	119.5	121	13.10	12.74

levels of intellectual abilities is presented in Table 2.

To explore the relationships between the motivational-emotional indicators and intellectual abilities, a correlation analysis was performed. The motivational-emotional group consisted of 30 variables, while the intellectual abilities group included 15 (9 subscales, 5 structural components, and 1 overall score). Since the correlation analysis revealed a small number of significant correlations, only those with coefficients significantly different from zero (p<0.05) are presented in Tables 3—5.

Table 3 reveals weak but significant negative correlations between respondents' well-being and their performance on subtests assessing the ability to memorize and utilize information. These tasks involve verbal-logical reasoning and the synthetic process of relating task conditions to the activation of relevant knowledge. Effective cognitive performance requires a certain level of tension, which is reflected in conscious cognitive processes. Psychological distress and tension may have a detrimental effect on visuospatial thinking, as evidenced in the performance on intellectual tasks from the subtests assessing spatial abilities.

The set of mathematical subtests broadly assesses a wide range of cognitive operations. A weak but significant inverse correlation was also found between task performance and the degree of self-criticality. These findings suggest that a positive self-image may interfere with the ability to solve arithmetic problems, thereby decreasing the efficiency of simpler cognitive tasks. Conversely, it is also possible that students with higher performance in mathematical tasks demonstrate greater self-criticism, reflecting on their own successes in this area and perceiving themselves negatively, as they strive for even higher achievements.

The correlation analysis was then conducted separately for the male and female samples. Similar to Table 3, only significant correlation coefficients (p < 0.05) are presented.

The data obtained from the correlation analysis for the female sample (Table 4)

Table 2

Composition of the Sample of Male and Female Participants by Intellectual Ability Level

Grade	Female group	Male group	Significance Level (p)
Average	10 (25%)	15 (23.1%)	0.41
Above Average	10 (25%)	17 (26.1%)	0.45
High	20 (50%)	33 (50.8%)	0.47
Total	40	65	

Table 3

Correlation Analysis Results Between Motivational-Emotional Indicators and Intellectual Abilities for the Entire Sample

	Mathematical Abilities	Spatial Abilities	Mnemonic Abilities	IQ
Assessment of Well-being			–0.22	–0.19
Positive Self-image	–0.21			
Psychological Distress and Tension		–0.22		–0.22

show a positive correlation between the severity of asthenic syndrome and performance on intellectual tasks, both overall and across specific subtests. This pattern is evident across all subtest complexes of R. Amthauer's Intelligence Structure Test, except for the subtests assessing spatial abilities. The higher the health level on the "asthenia" scale, the better the overall psychological state of the respondents, and the greater the productivity in cognitive operations. Additionally, it is worth noting that performance on the verbal intelligence subtests is negatively correlated with achievement motivation and the respondents' self-assessment of their sense of strength and energy.

For the male sample (Table 5), a weak positive correlation was found between life satisfaction and performance on the spatial subtest tasks, where participants engaged in non-verbal logic and visual-motor thinking.

Memory and perception processes appear to be relatively resistant to the influence of psychological states, while attention-related characteristics — such as stability, selectivity, and concentration — are more significantly affected.

A pronounced negative impact of psychological distress and overall tension was observed on the ability to solve intellectual tasks, particularly those requiring spatial thinking and analytical-synthetic activities.

The results also indicate that subjective well-being in males is closely linked to cognitive abilities, emphasizing the multidimensional nature of psychological functioning and the influence of subjective experiences on cognitive processes.

Thus, the study identified a set of motivational-emotional indicators that correlate with intelligence. The mean values of most cognitive and motivational-emotional indicators in the female and male samples did not differ significantly ($p>0.05$). Using the Student's *t*-test, differences were observed only for two parameters: the average level of achievement motivation was higher in the female sample, while potential obsessive-phobic traits were more pronounced in the male sample (see Table 7).

The results obtained align with the findings of C. Cabras et al. [20]. In their study, the authors reported that female students exhibit significantly higher levels of both

Table 4

Correlation Analysis Results Between Motivational-Emotional Indicators and Intellectual Abilities: Female Group

	Verbal Abilities	Mathematical Abilities	Mnemonic Abilities	IQ
Achievement Motivation	–0.33			
Asthenia Scale	0.38	0.42	0.33	0.36
Sense of Strength and Energy	–0.34			–0.37

Table 5

Correlation Analysis Results Between Motivational-Emotional Indicators and Intellectual Abilities: Male Group

	Mathematical Abilities	Spatial Abilities	IQ
Life Satisfaction		0.29	
Psychological Distress and Tension	–0.27	–0.26	–0.37

Table 6

Results of Identifying Differences in Correlation Coefficients Between Female and Male Groups

	Verbal Abilities	Mathematical Abilities	Spatial Abilities	Mnemonic Abilities	IQ
Achievement Motivation	–0.33/0.09 (p=0.039)				
Asthenia Scale	0,38/–0,04 (p=0.036)	0,42/–0,05 (p=0.018)		0.33/–0.01 (p=0.09)	0.36/–0.05 (p=0.0425)
Sense of Strength and Energy	–0.34/–0.08 (p=0.19)				–0.37/0.04 (p=0.0417)
Life Satisfaction			–0.21/0.29 (p=0.0155)		
Psychological Distress and Tension		0.18/–0.27 (p=0.0295)	–0.14/–0.26 (p=0.54)		0.04/–0.37 (p=0.0417)

Table 7

Significant Differences in Motivational-Emotional Indicators Between Female and Male Groups

Indicator	Mean		*t*	*df*	*p*
	Male	Female			
Achievement Motivation	15.43	18.28	–2.73	103	0.008
Obsessive-Phobic Disorders	2.02	1.2	2.122		0.036

external and internal motivation compared to their male counterparts. They attributed this outcome to the fact that motivation for success in female students is often linked to receiving positive feedback from significant adults, whereas in male students, this motivation is more influenced by external factors and material rewards. Furthermore, the authors found that females tend to display stronger emotional reactions in challenging situations, which, in turn, can lead to a decrease in the effectiveness of their intellectual performance when compared to males. This may be related to lower self-esteem or a more critical self-perception among females.

In another study conducted by Y.M. Shalaby [29], it is suggested that females tend to place greater emphasis on the emotional aspects of a task. In contrast, males are generally more concentrated on developing problem-solving strategies, which may increase their psychological distress levels and, consequently, negatively affect cognitive processes such as concentration and attention.

W.W.S. Lee's study [26] found that interest and persistence are negatively correlated with stress, while perceived academic failures have a positive correlation with stress. These findings further support the idea that psycho-emotional states can influence cognitive processes, and they highlight the interrelationship between intellectual abilities and emotional characteristics.

Conclusion

The presented review has enabled us to assess the current state of research on the correlations between emotional-motivational parameters and various types of intellectual abilities. Our findings have highlighted key aspects of the interrelationship between emotional-motivational factors and intellectual abilities in male and female students.

It was found that in the female sample, there is a statistically significant positive correlation: the absence of pronounced asthenia reflects a state of healthy psychological adaptation, high work capacity, and emotional stability, which positively influences the effectiveness of solving intellectual tasks of various types. In contrast, the results of verbal intelligence tests in female respondents were negatively correlated with achievement motivation. This pattern was not observed in the male sample, where achievement motivation was generally somewhat lower and did not significantly affect their cognitive performance. This phenomenon can be partially explained by the fact that optimal results are achieved with moderate motivation. Theoretically, males approach problem-solving in a more rational manner; however, during the study, they exhibited a higher level of anxious tendencies and psychological tension.

The results of our analysis underscore the importance of examining the interrelationships between intellectual abilities and the motivational-emotional parameters in male and female students. The findings of our study can inform the development of effective strategies for student learning and development, as well as contribute to the overall improvement of educational quality. Future research will focus on exploring the role of motivation and emotions in the regulation and disruption of cognitive processes among male and female students. It is crucial to emphasize that investigating this pressing issue is essential for a comprehensive understanding of the psychological development of students, which will ultimately support the formulation of strategies aimed at enhancing their intellectual abilities and motivation across both genders.

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