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## **PERSONAL RESOURCES OF CREATIVE POTENTIAL: TOLERANCE OF UNCERTAINTY**

### *Abstract*

The article presents the results of an experimental study of the state of tolerance to uncertainty, the relevance of which is related to the problem of developing creativity in a university. During the study, a modified version of the McLane Uncertainty Tolerance Scale (Multiple Stimulus Types Ambiguity Tolerance Scale-I, MSTAT-I), developed by E.N. Osin, was used for both groups of subjects. Gender differences among master's students on the subscales of the general D. McLane Scale were identified, and prospects for further study were identified. The main goal of this study was to study the state of tolerance to uncertainty and its connection with creativity among undergraduates. According to the overall indicator and the values of the three subscales, it was revealed that in men the level of tolerance is significantly higher at a statistically significant level.

**Key words:** creativity, creative potential, tolerance for uncertainty, attitude towards novelty, complex tasks, and uncertain situations.

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## **КРЕАТИВТІК ПОТЕНЦИАЛДЫҢ ЖЕКЕ РЕСУРСТАРЫ: БЕЛГІСІЗДІККЕ ТОЛЕРАНТТЫЛЫҚ**

### *Аңдатпа*

Мақалада өзектілігі университеттегі креативтілікті дамыту проблемасымен байланысты белгісіздікке толеранттылық жағдайын эксперименттік зерттеу нәтижелері келтірілген. Зерттеу барысында Е.Н.Осин әзірлеген Маклейннің белгісіздікке толеранттылық шкаласының (multiple Stimulus Types Ambiguity Tolerance Scale-I, MSTAT-I) өзгертілген нұсқасы субъектілердің екі тобына да қолданылды. Д.Маклейннің жалпы шкаласының кіші шкаласы бойынша магистранттарда гендерлік айырмашылықтар анықталды, әрі қарай оқу перспективалары анықталды. Бұл зерттеудің негізгі мақсаты белгісіздікке толеранттылық жағдайын және оның магистранттардағы креативтілік потенциалымен байланысын зерттеу болды. Үш кіші шкаланың жалпы көрсеткіші мен мәндері бойынша ерлерде толеранттылық деңгейі статистикалық маңызды деңгейде едәуір жоғары екендігі анықталды.

**Түйін сөздер:** креативтілік, креативтік потенциал, белгісіздікке толеранттылық, жаңалыққа көзқарас, күрделі міндеттерге және белгісіз жағдайларға көзқарас.

## **ЛИЧНОСТНЫЕ РЕСУРСЫ КРЕАТИВНОГО ПОТЕНЦИАЛА: ТОЛЕРАНТНОСТЬ К НЕОПРЕДЕЛЕННОСТИ**

### *Аннотация*

В статье приводятся результаты экспериментального исследования состояния толерантности к неопределенности, актуальность которой связана с проблемой развития креативности в вузе. В ходе исследования для обеих групп испытуемых была применена модифицированная версия Шкалы толерантности к неопределенности МакЛейна (Multiple Stimulus Types Ambiguity Tolerance Scale-I, MSTAT-I), разработанная Е.Н.Осиным. Выявлены гендерные различия у магистрантов по субшкалам общей Шкалы Д.Маклейна, определены перспективы дальнейшего изучения. Главная цель данного исследования заключалась в изучении состояния толерантности к неопределенности и ее связи с креативным потенциалом у магистрантов. По общему показателю и значениям трех субшкал было выявлено, что у мужчин уровень толерантности значительно выше на статистически значимом уровне.

**Ключевые слова:** креативность, креативный потенциал, толерантность к неопределенности, отношение к новизне, сложным задачам, неопределенным ситуациям.

### **INTRODUCTION**

The need to change the approach to training future specialists at a university is due to the fact that their professional activities will take place in radically new conditions. The post-industrial era that came as a result of the fourth industrial revolution is distinguished by the value of intellectual capital and unprecedented exponential growth, the introduction of new technologies, including information technologies, which affect all spheres of life. Its consequences are manifested in the fact that information, knowledge and skills rapidly become outdated, making them unsuitable for solving constantly emerging new situations, and even more so for innovation [1], [2].

Thus, the features of the post-industrial era created the “face” of the new VUCA world. No one doubts that its constituent characteristics (volatility, uncertainty, complexity, ambiguity) have left no room for the former certainty, linear determination and simplicity of the world [3].

It is because of the high uncertainty, complexity and ambiguity of the modern world that the concept of 21st century skills has emerged, in which creativity is one of the four central skills. Never have skills been given such a decisive role in personal adaptation. The concept arose as a response from the global scientific community, adequate to these challenges.

According to the objective conclusion of A.G. Asmolov, the incredible pace of change and the comprehensive nature of the growing uncertainty have become such that overcoming it no longer requires adaptation, but pre-adaptation [4]. One of the important ways of such pre-adaptation to a new and constantly changing world is G.P. Pirlík and D.B. Bogoyavlenskaya consider creativity. In contrast to ordinary cognitive activity, it makes a person potentially ready to overcome the uncertainty that will manifest itself in the future in encounters with unexpected, previously unknown and variously new situations [5]. The results of psychological research have confirmed the fact that any creative search begins only in conditions of uncertainty, when convergent thinking loses its productive power. It naturally follows that creativity is impossible without tolerance of uncertainty. By developing it, the individual thereby strengthens and increases his creative potential.

The concept of tolerance for ambiguity, introduced into scientific circulation in the middle of the last century by E. Frenkel-Brunswik, as a person’s attitude towards uncertainty, has hardly changed in content. However, during this time it became more specific, thanks to experimental

research. For example: in the definition of the author of the famous Tolerance of Uncertainty Scale by D. McLane, it is understood as the ability to perceive and understand uncertainty containing contradictory or deficient, unclear content [6]. The attitude towards it, according to D. McLane, is manifested in the way a person reacts to unusual, previously unknown, changeable and complex situations that cannot be clearly understood. The methods themselves constitute a continuum from avoidance to attraction to them [7, p.4]. In other words, the choice of response method depends on a person's subjective attitude to the situation of uncertainty, as threatening or desirable, attractive.

Numerous empirical data have revealed a significant relationship between creativity and tolerance for uncertainty. For example, T. J. Hwang, & J. N. Choi report that tolerance for uncertainty is a mediator in the relationship between mood modalities and creative productivity [8]. Results of C.A.Toh & S.R. Miller confirmed a strong tendency to choose new ideas and solutions by employees with a high level of tolerance for uncertainty [9]. Data from X.Wu, X.Gu, H.Zhang highlight a significant advantage for a person tolerant of uncertainty in the process of developing new ideas and creative problem solving [10]. F. Zenasni, M. Besançon, T. Lubart, as well as K. Stoycheva and T. Lubart share this position. Their results showed the important role of uncertainty tolerance in the heuristic decision-making process at all stages from generation to practical implementation [11], [12]. Bearing in mind the importance that tolerance to uncertainty has as a resource of creative potential, information about its current state is needed. The domestic scientific community is presented with an article by S.T. Bapaeva and B. Khalym on the experience of tolerance to uncertainty during a pandemic from the point of view of research prospects. There are no actual experimental studies of this issue, and especially in the context of creativity resources. Meanwhile, such empirical data obtained from the Kazakh sample have practical significance for organizing the development of creative abilities.

### **MAIN PART**

The purpose of the experimental study was to study the level of tolerance to uncertainty in young men and girls.

Tasks;

1. Conduct an exploratory study of tolerance to uncertainty among undergraduates.
2. Conduct a comparative analysis of differences in the structure of tolerance to uncertainty among young men and girls.
3. Carry out a statistical assessment of the significance of the differences.

Two experimental groups based on gender consisted of undergraduates in technical and humanitarian specialties of L.N. Gumilyov ENU. Accordingly, the first group included 70 young men, and the second - 51 girls.

The validity of the results obtained was ensured by: a) the equivalence of experimental samples by age and gender; b) equal testing conditions; c) anonymous answers to questions on the Tolerance Scale; d) testing statistical hypotheses about the significance of differences using the Student's test.

### **METHODOLOGY AND METHODS**

In the study, for both samples, the McLane Uncertainty Tolerance Scale (Multiple Stimulus Types Ambiguity Tolerance Scale-I, MSTAT-I), a modified version of E.N. Osin, was used.

D. McLane's original scale includes 22 statements. Adaptation on the Russian sample, carried out by E.N. Osin, excluded three of them. In the new composition of the "tolerance of uncertainty" construct, 19 statements remained, reflecting the content of the following five subscales: attitude towards novelty, attitude towards complex tasks, attitude towards uncertain situations, preference for uncertainty and tolerance/avoidance of uncertainty. In addition to the listed subscales, the technique allows you to determine the general level of tolerance to uncertainty [13].

The master's students used the instructions, expressing the degree of their attitude to the statements on a Likert scale from "completely disagree" to "completely agree" (1-7 points).

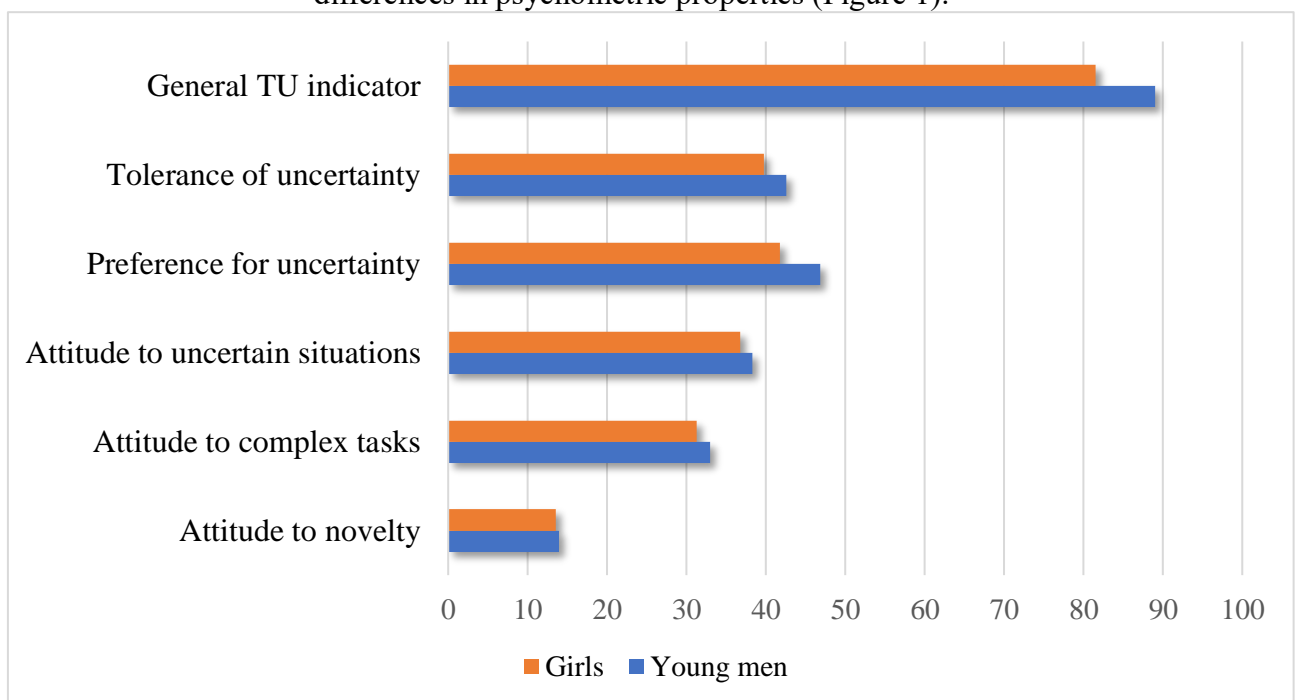
### **RESEARCH RESULTS**

A general analysis of the average level indicators of all subscales shows that they do not exceed the average values of psychometric indicators according to E.N. Osin, which he determined on a sample of Russian students, graduate students and researchers (Table 1). [13, p.78]. When comparing the results obtained with his data, the greatest similarity was found in the values of three subscales - attitude to novelty, attitude to complex tasks and attitude to uncertain situations. Psychometric indicators for subscales reflecting preference for uncertainty and tolerance for uncertainty were below average values.

**Table 1.** Average values of indicators of tolerance to uncertainty among ENU master's students L.N. Gumilyov and E.N. Osin

Subscales	Young men	Girls	E.Osin
Attitude to novelty	13,92	13,54	(13,92)
Attitude to complex tasks	32,98	31,27	(33,64)
Attitude to uncertain situations	38,27	36,8	(38,57)
Preference for uncertainty	46,88	41,76	(52,61)
Tolerance of uncertainty	42,6	39,72	(47,4)
General TU indicator	89,04	81,56	(100)

Further differentiated comparative analysis was carried out based on the average values of young men and girls - master's students of L.N. Gumilyov ENU. The results revealed the following differences in psychometric properties (Figure 1).



**Figure 1.** Level differences in tolerance subscales to uncertainty

Firstly, both young men and girls have almost the same “average” attitude towards novelty. This is the only subscale for which the values do not differ statistically. The questions that make up this subscale examine the individual’s position regarding the preference for the unknown and new over the familiar, and the attractiveness of everything new. Its content is very close in meaning to such a personal quality from the Big Five model as openness to experience, which correlates with all indicators of creativity. For example, according to R.M. Caligiuri, tolerance is positively correlated with openness [14]. F. Zenasni, M. Besanson, and T. Lubart also reported significant associations between openness to experience and divergent thinking [11].

Secondly, a slight but significant difference according to Student’s test was found in attitude to complex tasks ( $t = 5.7; p \leq 0.01$ ). In terms of the content of the subscale, young men are less likely than girls to avoid questions that are difficult to understand. On the contrary, they

are more attracted and enjoy understanding and solving problems that cause difficulties for other people.

A similar difference was revealed in relation to uncertain situations ( $t_{em} = 6.1$ ;  $p \leq 0.01$ ). The subscale questions reflect the degree of tolerance and ease of response to uncertain situations, the success of overcoming them, the emotional background and involvement in finding a way out of an uncertain situation, etc. Young men, to a greater extent than girls, do not perceive uncertain situations as potentially threatening, do not experience frustration and do not try to avoid them, and also believe that they often cope with them.

Thirdly, the maximum difference was established in the prevalence of preference for uncertainty among young men compared to girls

( $t_{em} = 21.4$ ;  $p \leq 0.01$ ). In general, young men consider any uncertainty that necessitates studying an issue or situation from several points of view and not having a single solution attractive. Hence, it is natural that young men are superior in the subscale of tolerance to uncertainty ( $t_{emp} = 9.1$ ;  $p \leq 0.01$ ) and, accordingly, in its general indicator ( $t_{emp} = 21.9$ ;  $p \leq 0.01$ ).

### **DISCUSSION**

The purpose of the study was to study the state of tolerance to uncertainty as a resource of creative potential among undergraduates. According to the overall indicator and the values of the three subscales, tolerance in young men is higher at a statistically significant level.

There is no unanimous opinion in the scientific community on the issue of the influence of sexual dimorphism. Our results confirm the empirical data of N. Seidi, R. Srivastava, A. M. Maubach & S. I. Morgan and others that men have a higher tolerance to uncertainty and associated stress compared to women. At the same time, they disagree with other results, for example, S.K. Kamran, according to which there are no statistically significant differences. A number of researchers have suggested that the cause of inconsistency may be the context of the situation in which uncertainty and the influence of ethnic culture and stereotypes arise.

According to the author, it is important that the level of tolerance to uncertainty in both young men and girls does not exceed average values. In the broad context of influences, it indicates the priority of undergraduates, and especially girls, of the value of psychological safety over the value of creativity.

It is known that the basic need of an individual for psychological safety has a direct impact on the willingness to take risks, which has significant correlations with the level of creativity and all stages of the creative process. We are talking about the readiness to take intellectual and social risks associated with the possibility of failure in situations of searching for a creative solution. Willingness to risk stops and restrains the influence of negative emotional states that arise in connection with the perception of uncertainty as frightening or threatening and expands the range of reactions to overcome it. Thus, fear and anxiety noticeably narrow the range of ways of reacting, even to the point of avoidance, which prevents the disclosure of creative potential.

According to the results obtained, in general, girls more than young men strive for psychological safety using escapism. They more often move away from uncertainty towards the familiar and familiar, i.e. into the psychological comfort zone. Young men, being more tolerant of uncertainty, experience psychological well-being and feel confident in uncertain, difficult situations. Moreover, they attract young men. The unusual, vague and incomprehensible are perceived as complex and interesting by them to a greater extent than by girls.

The differences may be due to the characteristics of the experimental sample. For example: among young men there are more of those who are characterized by low anxiety. In the future, it is possible to study a larger representative sample, which would also include the measurement of psychometric indicators of risk readiness and anxiety. Factors such as gender stereotypes can also have an influence. For example: the socialization of young men within the framework of a traditional ethical stereotype encourages and reinforces tolerance of uncertainty in their behavior through encouraging research activity, courage, willingness to take risks, etc.

### **CONCLUSION**

The current level of tolerance to uncertainty indicates the need to strengthen it as a resource of creative potential among undergraduates. This need is dictated by the need to develop creativity, which is a key skill of the 21st century - competence and the key to the success of university graduates in future professional activities.

Currently, in psychological science, the problem of research aimed at the practical solution of the issue of preparing graduates for adaptation and activity in the new VUCA world, increasing personal resources of creativity, is being updated. In relation to such a resource as tolerance for uncertainty, research is being conducted in educational psychology, combining the ideas of social-cognitive and positive psychology. An example is the research of V. M. De Roma and R. A. Beghetto. They indicate the practical significance of such an organization of educational activities, during which desensitization occurs - a reduction in fear and anxiety of uncertainty as a condition for the actualization of creative abilities.

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