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Research article

Adaptive Potential of Students of Different Age Groups During a Pandemic

Tatyana I. Kulikova[1]✉, Svetlana A. Filippova[2]
[1, 2] Tula State Lev Tolstoy Pedagogical University, Tula, Russian Federation

✉ tativkul@gmail.com

Abstract
Introduction. This paper demonstrates the importance of studying adaptive potential in students during a pandemic and its parameters as a basis for mental health and psychological well-being. The authors describe the structure and key parameters of adaptive potential in their relation to hardiness. This study aimed to investigate associations of psychological flexibility as a predictor of adaptability with other manifestations of adaptation mechanisms. This paper brings new insights into the dynamics of adaptability at different stages of adolescence. **Methods**. The study sample comprised 67 students aged 18 to 24 years (Mean ± SD = 20.7 ± 1.8). Diagnostic instruments: (a) the Hardiness Survey by S. Muddy, (b) Young Schema Questionnaire, YSQ-S3R, (c) Ways of Coping Questionnaire, WCQ, by R. Lazarus, and (d) Clinical Questionnaire for Detection and Evaluation of Neurotic States by K. K. Yakhin and D. M. Mendelevich. All statistical analyses were performed using IBM SPSS Statistics 27 software. Methods of mathematical statistics: Pearson's correlation coefficient, parametric Student's t-test, and Mann–Whitney U-test for independent samples. **Results and Discussion**. Correlation analysis showed the existence of strong inverse correlations of hardiness with maladaptive schemas, including 'vulnerability', 'distrust', 'submission', 'failure', 'rigid standards', 'dependence/helplessness', and 'defectiveness', as well as neurotic states and coping strategies. Therefore, the authors identified two contradictory trends in adaptation to the COVID-19 pandemic in different age groups. The scales of early maladaptive schemas (EMS) and coping strategies have numerous positive correlations, except for the 'decision planning' strategy, which correlates negatively with certain schemas. The authors consider EMS as a manifestation of psychological rigidity, which reduces adaptive potential. The absence of pronounced maladaptive schemas increases adaptive potential. There is a positive age-related dynamics in the development of individual adaptation capabilities. The resistance indicator increases and the EMS manifestation decreases with age.

Keywords
hardiness, maladaptive schemas, coping strategies, adaptive potential, psychological flexibility, adaptation mechanisms, students, age-related dynamics, COVID-19 pandemic, correlation analysis

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Highlights

➢ The structure of adaptive potential is formed by high rates of hardiness and manifestations of psychological (cognitive and behavioral) flexibility.

➢ Adaptive potential increases with age. At different ages, the mechanisms of adaptation are different.

➢ Indicators of psychological well-being increase with age. The trend towards neurotic defensive reactions decreases; psychological flexibility increases due to the formation of cognitive and behavioral flexibility.

➢ Preventive and corrective work aimed at the formation of flexible cognitive attitudes and the expansion of the repertoire of behavioral responses contributes to the development of individual adaptive potential.

Introduction

The COVID-19 pandemic has changed many areas of human activity and has also created massive psychological challenges. The response of populations to the pandemic has played an important role in the emergence and wide spread of adjustment disorders (Enikolopov, Boiko, Medvedeva, Vorontsova, & Kaz'mina, 2020). Researchers both in Russia and abroad point to an increase in the number of anxiety factors, changes in individuals' habitual behavior (Chertovikova, 2018; Quansah et al., 2022). Periods of self-isolation in a pandemic situation were associated with considerably increased levels of stress, anxiety, and depression, which represent internal conditions that directly and adversely affect the general well-being of an individual (Makarova & Tsvetkova, 2020; Almondes et al., 2021; Nash, 2021). For example, a study of emotional exhaustion in Chilean students during the pandemic showed that 15 % of students had serious mental health problems; moderate depression increased from 17.7 % to 20.7 %, severe depression increased by 5.2%, severe anxiety increased from 16.7 % to 26.4 %, and severe stress increased from 9.4 % to 15.9 % (Martinez-Libano, Yeomans, & Oyanedel, 2022). Emotional exhaustion refers to a situation that negatively affects an individual's life and that is characterized by a considerable decrease in psychological well-being (Chertovikova, 2018; Eidel'man, 2016; Hendriksen et al., 2021; López-Valenciano, Suárez-Iglesias, Sanchez-Lastra, & Ayán, 2021).

The authors have examined individuals' adaptive capabilities (Karapetyan & Glotova, 2018) and adequate attitudes to the current situation, even in a pandemic (Malykh & Sitnikova, 2021), as determinants of psychological well-being. In both evolutionary and psychological terms, an indicator of an individual's well-being is their ability to adapt to environmental conditions (Aleksandrova, 2004). The high adaptive potential is due to the breadth of the range of cognitive, emotional, and behavioral responses. Having an extensive repertoire of reactions and the ability to switch flexibly between them, it becomes possible to satisfy the conditions and requirements of the current situation to the maximum. Psychological (cognitive and behavioral) flexibility promotes adaptation while psychological (cognitive and behavioral) rigidity reduces individual adaptive capabilities.

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Cognitive flexibility is an individual's ability to quickly change the habitual way of thinking, abandon habitual but ineffective behavioral patterns, and adapt behavior and style of thinking to the environment. Cognitive rigidity, on the contrary, is understood as an individual's inability to change ideas about the environment in accordance with its real changes and, as a result, the use of inadequate stereotypical forms of behavior in a particular situation (Yashin, 2015).

In a previous study (Filippova, Pazukhina, Kulikova, & Stepanova, 2019), the authors have found that rigidity negatively correlates with the indicators of hardiness, while the lack of personal flexibility positively correlates with hardiness and a tendency to form neurotic defensive reactions. The authors conclude that the rigidity of personality traits reduces adaptive potential, while neurotic reactions can be considered as a transient (and successful) mechanism of adaptation to the environment increasing hardiness. In this study, we also rely on the key ideas of the cognitive-behavioral approach that the condition for successful adaptation is the flexibility of perception, thinking, and behavior, whereas the rigidity of cognitive and behavioral patterns affects adaptive mechanisms and hardiness.

During the period of university studies, which covers different periods of adolescence, there is an increased emotional excitability (imbalance, mood swings, anxiety, etc.) (Dontsov & Dontsova, 2013; Beiter et al., 2015; Quansah et al., 2022). The age crisis is complicated by the specifics of the student's life situation, which requires the preparedness and ability of students to cope with various personal, academic and social problems (Krasnova-Gol'eva & Kholmogorova, 2011; Valenti & Faraci, 2021).

A comparative analysis of psychological maladjustment among students of the system of secondary vocational education and higher professional education has made it possible to state that the severity of symptoms of emotional maladaptation in university students is higher compared to secondary vocational education students. According to the authors, an important aspect of psychological maladjustment is social anxiety (Gorchakova et al., 2013), which is based on "an increase in social responsibility, the need to follow social norms, an increase in needs against the background of a lack of opportunities to satisfy them, a change in priorities in the motivational sphere, etc." (Dontsov & Dontsova, 2013, p. 42). This can have a serious negative impact on the adaptation process, as well as on the student's quality of life (Aleksandrovskii, 2012; Petrova & Nazarenko, 2021).

During this period the most relevant behavioral methods to overcome emerging difficulties associated with both external and internal specific requirements are coping strategies. People use these strategies to cope with stress, including the one caused by the pandemic, as well as personal resources that affect the mechanism of the adaptation process, forming associations with symptom complex of hardiness and neurotic reactions.

The adaptation potential is a hierarchical structure, the formation of which is laid in the early stages of embryogenesis. CNS properties create canvas for emotional and behavioral response to frustration and stress. The highest level of the adaptation process is personal. It is formed on the basis of the interaction of the individual with the environment. Under the influence of similar conditions, various individuals can have similar beliefs and behavioral patterns formed. The author of the scheme therapy Jeffrey Young called them early maladaptive schemas (hereinafter referred to as EMS) (Young, Klosko, & Weishaar, 2003).

A number of works of modern Russian researchers show the EMS relationship with psychological well-being (Bogdanov, Galimzyanova, Kas'yanik, Romanova, & Zavarzina, 2019; Tikhomirova &

Grishina, 2016), depressive disorders and addictions (Kadyrov & Mironenko, 2017), and personality disorders (Kholmogorova, 2014). They also show the dynamics of the severity of EMS at different stages of adulthood (Galimzyanova, Kas'yanik, & Romanova, 2016).

We deem it to be relevant in the established pandemic conditions to consider the structure of the adaptive potential of students at different stages of youth in the context of its dependence on cognitive and behavioral flexibility/rigidity.

This *study aims* to evaluate the adaptive potential of students during the COVID-19 pandemic period and to characterize the dynamics and mechanisms for adaptation of students in different age groups.

Methods

A total of 67 TSPU students at the age of 18 to 24 participated in our study of the adaptive potential of students during the pandemic. The average age of the subjects was 20.7 ± 1.8 years, and the median age was 21 years. The criterion for dividing the subjects into two groups was the median value of age: group 1 – age ≤ 21 years and group 2 – age 22+. We divided the subjects into two age groups and analyzed the differences between them in terms of the studied indicators.

The following psychological assessment tools: (a) the Hardiness Survey by S. Muddy (Leont'ev & Rasskazova, 2006), (b) Young Schema Questionnaire, YSQ-S3R, modified by P. M. Kasyanik and E. V. Romanova, (c) Ways of Coping Questionnaire, WCQ, by R. Lazarus, and (d) Clinical Questionnaire for Detection and Evaluation of Neurotic States by K. K. Yakhin and D. M. Mendelevich. All statistical analyses were performed using IBM SPSS Statistics 27 software. Descriptive statistics methods were used; the data were presented as mean and standard deviation (Mean ± SD), quartile measurement (Me [Q1; Q3]). We also calculated the asymmetry coefficient (As) and excess kurtosis (Ek) to assess the normality of the distribution. In order to establish the tightness of the connection between the studied parameters the study used Pearson's correlation coefficient (r). The parametric Student's t-test and the Mann–Whitney U test for independent samples were used as a method for comparing quantitative indicators.

Results and Discussion

The primary descriptive analysis of the entire sample (n = 67) was carried out without division into groups in order to obtain comprehensive information about the data of the empirical study, the distribution and homogeneity of the data, the presence of errors and outliers, and the possibility of using parametric analysis methods.

The study carried out the analysis of the obtained data on the S. Muddy's vitality test in two ways using a parametric (Student's t-test) and a non-parametric test (Mann–Whitney U test). As a result, we found that between the two experimental groups (≤ 21 and 22+) there were differences in the indices of the structural components of hardiness (p-value < 0.001). The average score on the 'hardiness' scale in both the first and second groups was in the range of the average value, the median indicators were also close to the average value in both groups. Thus, the adaptive potential of the sample during the pandemic can be generally characterized as quite high.

The study found the dynamics of hardiness indicators at different stages of adolescence (Pearson's coefficient). Structural components of hardiness (involvement and risk acceptance) in different age groups had different levels of manifestation: involvement and age had a positive relationship (r = 0.428; p < 0.001), risk acceptance and student age had a weak positive relationship

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(r = 0.271; p < 0.001). We also found the internal consistency of the involvement and risk-taking scales (r = 0.885; p < 0.001).

Using the regression analysis, we obtained a model of the dependence of hardiness on age (without division into groups), which is characterized by a non-linear change in the hardiness index (Fig. 1).
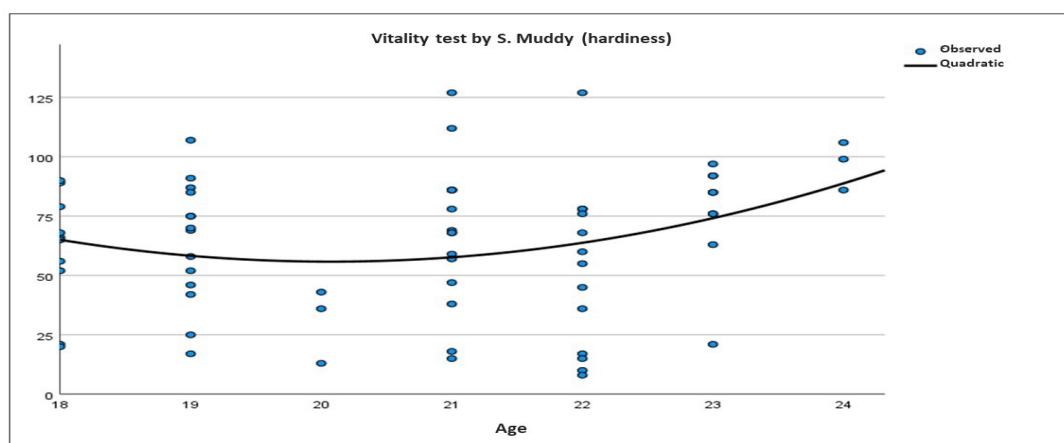

Figure 1. Regression model of hardiness versus age (without division into groups)

We found that the period from 18 to 21 years of age has a slight decrease in the indicators of students' hardiness, but at the age of 22+ there is an increase and then a gradual increase in hardiness.

To determine the dominant neurotic states according to the Clinical Questionnaire by K. K. Yakhin and D. M. Mendelevich, we performed a descriptive analysis of the results of the entire sample (n = 67) without division into groups (Table 1).

Table 1

Descriptive analysis of the results of the sample (n = 67) without division into groups according to the Clinical Questionnaire by K. K. Yakhin and D. M. Mendelevich

Scale name	Mean ± SD	Me[Q1; Q3]	min; max
Anxiety	1.32 ± 4.25	1.52 [–1.33; 4.68]	–7.11; 8.62
Neurotic depression	–0.09 ± 4.92	1.16 [–3.1; 3.41]	–12.86; 8.15
Asthenia	2.44 ± 4.33	3.07 [–0.06; 5.45]	–9.07; 9.67

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Table 1

Descriptive analysis of the results of the sample (n = 67) without division into groups according to the Clinical Questionnaire by K. K. Yakhin and D. M. Mendelevich

Scale name	Mean ± SD	Me[Q1; Q3]	min; max
Conversion disorders	0.89 ± 4.49	2.15 [–2.92; 4.33]	–9.04; 7.03
Obsessive-phobic disorders	–0.28 ± 3.96	–0.22[–2.29; 2.02]	–10.6; 6.28
Autonomic disorders	2.13 ± 7.58	3.08 [–3.5; 8.52]	–16.33; 14.28

According to the values of the mean and median indicators, the study identified two dominant scales – 'neurotic depression' and 'obsessive-phobic disorders'. Comparing the distribution of two age groups according to the selected scales (Fig. 2, 3), it is possible to see that the main part of the group of students aged 22+ is concentrated on both scales within the boundaries of the 'boxes' from –2.52 to 4.75, while the main part the age group of students ≤ 21 ranges from –11.25 to 6.72. Obviously, the degree of data scatter in the 22+ group is less than in the group ≤ 21. Thus, the group of students aged ≤ 21 (especially those aged 19–20 years) is prone to the formation of neurotic reactions.
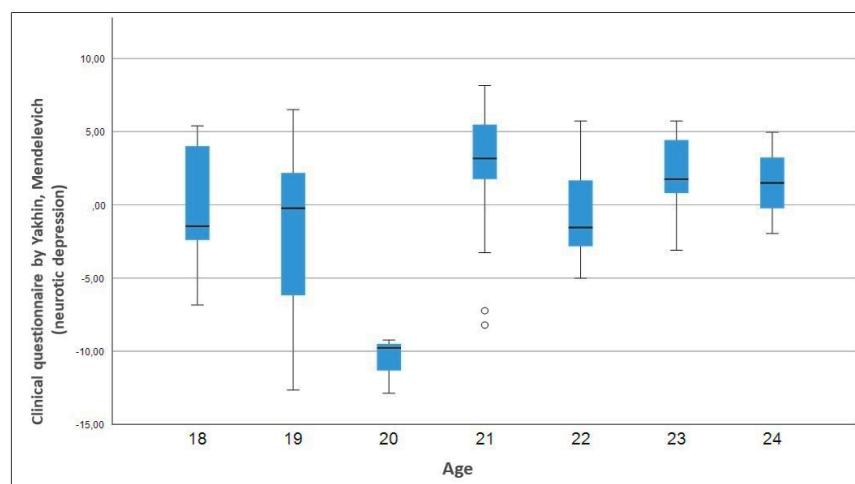

Figure 2. The manifestation of indicators in students of different age groups on the scales of 'neurotic depression' and 'obsessive-phobic disorders'

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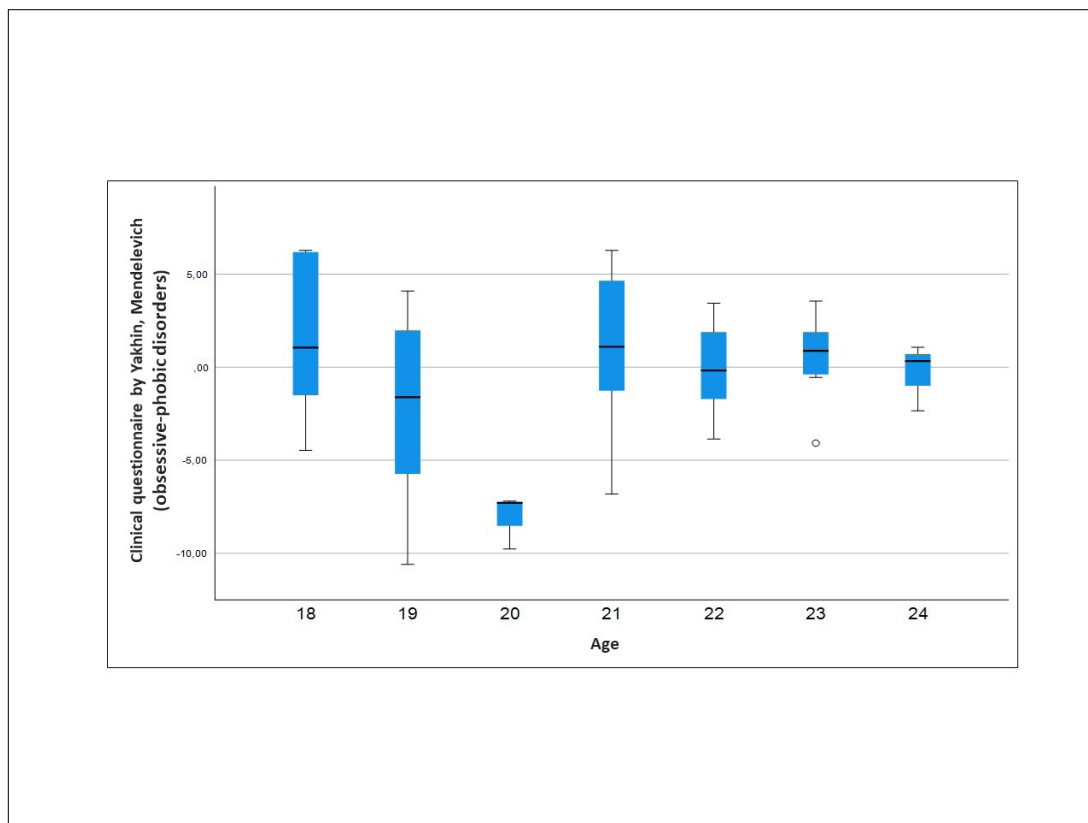
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Figure 3. The manifestation of indicators in students of different age groups on the scale of 'obsessive-phobic disorders'

Despite the fact that the tendency to develop neurotic reactions falls under the clinical diagnosis of neurosis, we should take into account the positive correlation of these reactions with hardiness parameters and the negative correlation with EMS. Consequently, it is possible to consider neurotic reactions as a transient, leveling with age, mechanism of adaptation to external conditions.

Based on the enlarged categories (domains) of maladaptive schemas identified by Young (Young et al., 2003), we identified four significant ones among the respondents, including breakdown of ties and rejection (BTR), impaired autonomy (IA), focus on others (F/O) (impairment of the need for self-esteem and self-acceptance), and hypervigilance and inhibitions (HI) (impairment of the need to freely express individual needs and emotions).

The most prominent maladaptive categories were 'breakdown of ties and rejection' (BTR) and 'hypervigilance and inhibitions' (HI). In these categories, we found 14 statistically significant connections between individual schemas (with coefficients r = 0.271÷0.709, at p < 0.01 and p < 0.05). The connections found indicate the internal consistency of the test, as well as the totality of the maladaptive mentality – maladaptive attitudes in a certain area (domains) do not exist in isolation from others.

Based on the results of the summary report on observations (n = 67), we constructed a chart of the age dynamics of the manifestation of maladaptive schemas among students (Fig. 4).
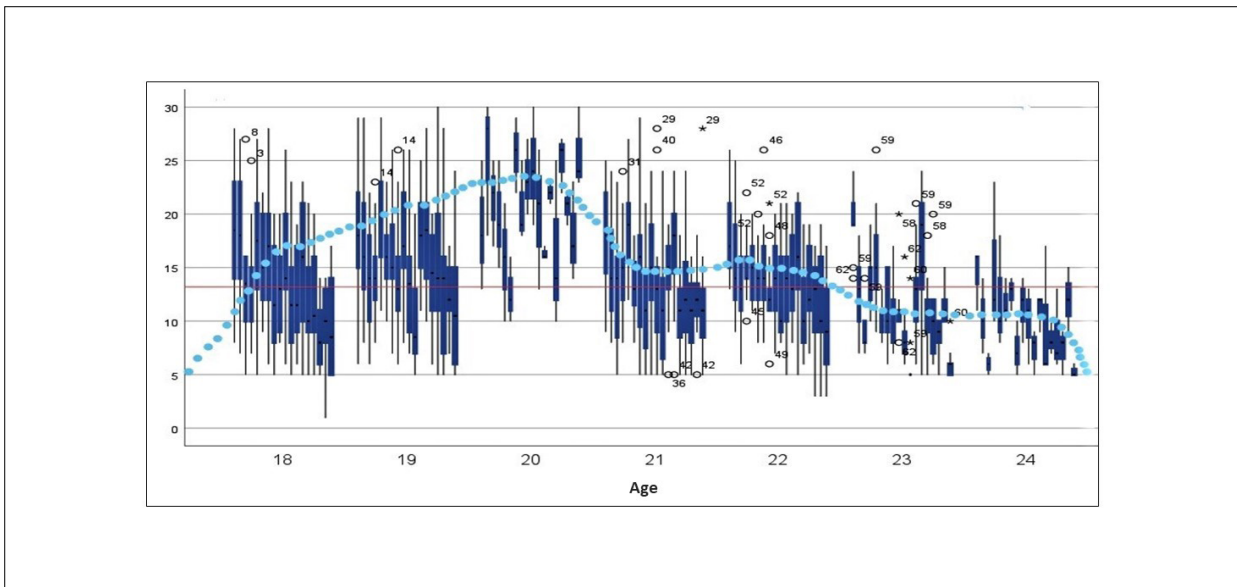
Figure 4. Chart of the age dynamics of the severity of maladaptive schemas among students

We found that the greatest manifestation of maladaptive schemas falls on the age of 19-20 years and significantly exceeds the median values; in the period of 21–22 years of age there is an 'equalization' and in 23–24 years – a decrease in the severity of EMS in students.

The age dynamics of EMS is consistent with the data on the dynamics of hardiness and the dynamics of neurotic reactions, which suggests that the adaptive capabilities of students increase with age.

Correlation analysis (r-Pearson's coefficient) shows numerous connections between the scales of EMS, hardiness, neurotic states, and coping strategies (Table 2).

Table 2
Correlations between indicators of hardiness, maladaptive domains, coping strategies, and neurotic states

Maladaptive domains		Hardiness parameters				Neurotic states	
		Iv	C	Ra	Hd	Nd	OPs
	S2		–0.519**			–0.515**	–0.702**
BTR	S7	–0.575**	–0.652**	–0.595**	–0.326*	–0.638**	–0.620**
	S10					–0.682**	–0.524**

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Table 2

Correlations between indicators of hardiness, maladaptive domains, coping strategies, and neurotic states

Maladaptive domains		Hardiness parameters				Neurotic states	
		Iv	C	Ra	Hd	Nd	OPs
IA	S4	–0.538**	–0.638**	–0.520**		–0.623**	–0.491**
	S6	–0.470**	–0.606**	–0.527**		–0.571**	–0.605**
	S5				–0.575**		–0.367*
F/O	S3	–0.475**	–0.661**	–0.543**	–0.425**	–0.620**	–0.709**
HI	S8		–0.529**		–0.530**	–0.565**	–0.693**
	S9	–0.369*	–0.649**	–0.376*	–0.348*	–0.602**	–0.454**
	S2	–0.492**	–0.690**	–0.589**	–0.385**	–0.727**	–0.586**
Coping strategies	Sc		–0.435**	–0.353*	–0.375*	–0.624**	–0.518**
	Ar		–0.375*			–0.350*	–0.357*
	F/A		–0.564**	–0.357*	–0.447**	–0.582**	–0.659**
	Pr			0.336*			
Neurotic states	Nd	0.448**	0.642**	0.567**	0.404**		
	OPs	0.388**	0.600**	0.522**	0.448**		

Notes: 1. The table uses the following abbreviations: *BTR* – breakdown of ties and rejection; *IA* – impaired autonomy; *F/O* – focus on others; *HI* – hypervigilance and inhibitions; *S1* – rigid standards; *S2* – distrust; *S3* – vulnerability; *S4* – suppression of emotions; *S5* – submission; *S6* – negativism/pessimism; *S7* – alienation; *S8* – failure; *S9* – dependence/helplessness; *S10* – defectiveness; *Sc* – self-control; *Ar* – acceptance of responsibility; *F/A* – flight/avoidance; *Pr* – positive revaluation; *Nd* – neurotic depression; *OPs* – obsessive-phobic syndrome; *Iv* – involvement; *C* – control; *Ra* – risk acceptance; *Hd* – hardiness.

2. * Correlation is significant at the *0.05* level; ** Correlation is significant at the *0.01* level.

We considered the dominant schemas, strategies and states in the sample. EMS, as well as coping strategies, had strong negative relationships with hardiness. At the same time, neurotic states positively correlated with hardiness and negatively correlated with EMS and coping. Obviously, neurotic states have a positive effect on the adaptation process.

In addition, the EMS scales and coping strategies had numerous positive relationships ($p < 0.01$), with the exception of the 'decision planning' strategy, which had negative relationships with some schemas found in the sample ($p < 0.01$; $p < 0.05$). The observed correlations give grounds to consider EMS and coping as manifestations of psychological rigidity that reduce the potential of an individual's hardiness. In other words, it is possible to argue that the presence of strict, rigid rules and attitudes that determine the behavior of an individual in a stressful situation reduces adaptive capabilities.

The process of adaptation to the conditions of the pandemic at student age can be described as successful; the level of adaptation increases with age. Sensitivity and a tendency to neurotic defense mechanisms ensure psychological flexibility in early adolescence; it is ensured by cognitive and behavioral flexibility at older ages.

Adaptive mechanisms of the neurotic type can be considered as transient states, characteristic, to a greater extent, of early youth; they bring psychophysiological discomfort, which increases the likelihood of seeking specialized help.

Psychological rigidity can be identified using the EMS questionnaire and coping strategies; both are manifestations of rigid beliefs and rules that reduce the range of behavioral response to the current situation. An exception (in our sample) is the 'solution planning' coping strategy, which probably allows taking into account the current environmental parameters and individual resources.

Manifestations of maladaptive schemas at the subjective level are not perceived as sharply as neurotic ones. Rigid attitudes and beliefs are assessed as normative. There may be no critical attitude towards them.

Conclusion

Thus, we may conclude that individuals characterized by cognitive and behavioral flexibility and those characterized by cognitive and behavioral rigidity are prone to the manifestation of opposite adaptive tendencies. The adaptation process proceeds more successfully in individuals characterized by cognitive and behavioral flexibility, who do not have pronounced EMS. The adaptation process proceeds differently at different stages of adolescence.

EMS is the psychological rigidity of an individual's worldview and his/her self-image, the stagnation of adaptive mechanisms, and the complexity of rapid restructuring in changing conditions. This fact explains the complexity of forming the intention to seek psychological help and formulating a request.

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Author Contribution

T. I. Kulikova developed the research concept, supervised the study, analyzed and interpreted the results, prepared and edited the text of the manuscript.
S. A. Filippova carried out the empirical study, collected the data, worked with sources, and wrote the overview part of the article.

Author Details

Tatyana Ivanovna Kulikova – Cand. Sci. (Psychology), Associate Professor, Tula State Lev Tolstoy Pedagogical University, Tula, Russian Federation; Scopus Author ID: 55570121100, ResearcherID: AAI-5902-2020, SPIN code: 7146-40606; e-mail: tativkul@gmail.com
Svetlana Anatolyevna Filippova – Cand. Sci. (Psychology), Associate Professor, Tula State Lev Tolstoy Pedagogical University, Tula, Russian Federation; SPIN code: 9123-7497; e-mail: wega-04@mali.ru

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