ISSN: 1814-2052
ISSN (online): 2311-7273

ПСИХОЛОГИЧЕСКАЯ НАУКА И ОБРАЗОВАНИЕ

№ 5
2022

PSYCHOLOGICAL SCIENCE AND EDUCATION

ПСИХОЛОГИЧЕСКАЯ НАУКА И ОБРАЗОВАНИЕ

2022 • Том 27 • № 5

PSYCHOLOGICAL SCIENCE AND EDUCATION

Московский государственный психолого-педагогический университет
Психологический институт Российской академии образования

Moscow State University of Psychology & Education
Psychological Institute of the Russian Academy of Education

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The new issue of the journal “Psychological Science and Education” (No. 5-2022). The issue traditionally presents two rubrics “Developmental Psychology" and “Educational Psychology”.

The rubric “Educational Psychology” opens with a study of the preferences of the format of education by university students on the example of Moscow City University. The results of the study demonstrate three groups of students who prefer full-time, blended and online formats of education, between whom significant differences in terms of indicators of natural science literacy and thinking were revealed. Another study in this section is devoted to the relationship between academic motivation and burnout on the example of students in Russia and Azerbaijan. In the next study, the authors present the results of studying the relationship between the educational achievements of students and the number of migrant students in the institution. The study used data from 80 regions of Russia.

Two articles of the rubric are devoted to the topic of inclusive education. The authors of one of them reveal the topic of health-saving in educational organizations. In another study, the authors consider one of the problems of modeling an inclusive educational environment. The results are presented illustrating that support measures for students with disabilities can become the basis for their active participation in the educational process.

The “Developmental Psychology” rubric presents a study on psychological well-being. The authors set a goal to identify supportive and dysfunctional factors that affect the level of psychological well-being of students. Interestingly, the level of subjective well-being differs significantly depending on the level of metacognitive involvement.

The last two articles of the rubric consider the topic of mastering the reading skill by younger students. Authors from Bosnia presented the results of a two-year longitudinal study of reading development. Another article assesses the reading skills of first-graders in two countries, in Russia and in a bilingual environment in Kazakhstan. The study was carried out using the reading scale of the computerized tool “Start”.

We hope that the readers of the journal will find the new issue of the journal “Psychological Science and Education” interesting.

The Editorial Board

Психологическая наука и образование
2022. Т. 27. № 5. С. 5—20
DOI: https://doi.org/10.17759/pse.2022270501
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 5—20
DOI: https://doi.org/10.17759/pse.2022270501
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Face-to-face, Blended or Online: How do Students Prefer to Study?

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The article presents the findings of a study on the learning format preferences in students of the Moscow State University of Psychology & Education (N=761) in February-March 2022. Face-to-face learning (FTF) was chosen by 10.8% of students, blended learning (lectures in distance format, seminars and practical classes in-person) (BL) — 39.7%, distance learning (DL) — 49.5%. There were no differences between the 3 groups by gender and age. In the BL group, compared to the DL group, logical thinking (p=0.001) and verbal intelligence (p=0.003) are better developed, natural science literacy rates are higher (p=0.018), there is a better understanding of the vaccination benefits against COVID-19 for the individual and society (p=0.016) and less confidence in serious negative consequences of the coronavirus vaccine (p=0.005). In the FTF group, compared to the DL group, there is a lower fear of COVID-19 disease (p=0.050) and a higher estimate of the vaccination benefits against COVID-19 for an individual and society (p=0.050). Cluster analysis using K-means method identified 2 clusters. Cluster 1 includes respondents with more developed logical thinking, verbal intelligence, better natural science literacy, better understanding of the vaccination benefits against COVID-19 for a person and society and less prone to various fears, doubts, underestimation of the danger of coronavirus and distrust of vaccination. In Cluster 1, as compared to Cluster 2, the share of respondents preferring BL prevails (44.4% vs 37.1%), and the share of those who prefer DF is lower (43.8% vs 52.6%); the differences are significant at the trend level. The shares of respondents preferring FTF are practically the same and make up only about 10%. Using the method of logistic regression analysis, 4 statistically significant predictors were identified and a model was built to predict the respondents' choice of the BL vs DL. The older the respondent, the more pronounced his/her fear of COVID-19, the lower his/her logical thinking, and the less confident (s)he is in the vaccination benefits against coronavirus for the individual and society, the more likely (s)he is to prefer DL over BL. Conversely, BL is more likely to be preferred over DL by younger respondents with higher logical reasoning scores, less fear of COVID-19 disease, and greater confidence in the vaccination benefits against coronavirus for the individual and society. The overall prediction accuracy of the model is 60.4%.

Keywords: vaccination, COVID-19, prevention, vaccination attitude, blended learning, distance learning, face-to-face learning.

Acknowledgements. The authors thank the management, staff and students of the Moscow State University of Psychology & Education (MSUPE) for their assistance in organizing and conducting the study.

For citation: Margolis A.A., Sorokova M.G., Shvedovskaya A.A. Face-to-face, Blended or Online: How do Students Prefer to Study? *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2022. Vol. 27, no. 5, pp. 5—20. DOI: https://doi.org/10.17759/pse.2022270501 (In Russ.).

Очный, смешанный или онлайн-формат: как предпочитают учиться студенты?

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Представлены результаты исследования предпочтений формата обучения студентами вуза на примере Московского государственного психолого-педагогического университета (N=761). Исследование проведено в феврале-марте 2022 года. Установлено, что очный формат (ОФ) выбрали 10,8% студентов, смешанный формат (СФ) — 39,7%, дистанционный формат (ДФ) — 49,5%. Различий между 3-мя группами по полу и возрасту не выявлено. В группе СФ по сравнению с ДФ лучше развиты логическое мышление (p=0,001) и вербальный интеллект (p=0,003), выше показатели естественно-научной грамотности (p=0,018), лучше понимание пользы вакцинации от COVID-19 для человека и общества (p=0,016) и меньше уверенность в серьезных негативных последствиях вакцины от коронавируса (p=0,005). В группе ОФ по сравнению с ДФ ниже страх заболевания COVID-19 (p=0,050) и выше оценки пользы вакцинации от коронавируса для человека и общества (p=0,050). Кластерный анализ методом K-средних позволил выделить два кластера. Кластер 1 — это респонденты с более развитым логическим мышлением, вербальным интеллектом, лучшей естественно-научной грамотностью, лучше понимающие пользу вакцинации от COVID-19 для человека и общества и менее подверженные разнообразным страхам, сомнениям, недооценке опасности COVID-19 и недоверию к вакцинации. В Кластере 1 по сравнению с Кластером 2 преобладает доля респондентов, предпочитающих СФ (44,4% vs 37,1%), и меньше доля предпочитающих ДФ (43,8% vs 52,6%), различия значимы на уровне тенденции. Доли респондентов, предпочитающих ОФ, практически одинаковы и составляют всего около 10%. Методом логистического регрессионного анализа выделены 4 статистически значимых предиктора и построена мо-

дель, позволяющая предсказать выбор респондентами формата СФ vs ДФ. Чем старше респондент, чем сильнее у него выражен страх заболевания COVID-19, чем меньше показатели его логического мышления и чем менее он уверен в пользе вакцинации от COVID-19 для человека и общества, тем более вероятно, что он предпочтет ДФ по сравнению с СФ. Наоборот, СФ является скорее предпочтительным по сравнению с ДФ для более молодых респондентов с более высокими показателями логического мышления, меньшим страхом заболевания COVID-19 и большей уверенностью в пользе вакцинации от COVID-19 для человека и общества. Общая точность прогноза модели равна 60,4%.

Ключевые слова: вакцинация, COVID-19, профилактика, отношение к вакцинации, смешанное обучение, дистанционное обучение, очное обучение.

Благодарности. Авторы благодарят руководство, сотрудников и студентов Московского государственного психолого-педагогического университета (ФГБОУ ВО МГППУ) за помощь в организации и за участие в проведении исследования.

Для цитаты: *Марголис А.А., Сорокова М.Г., Шведовская А.А.* Очный, смешанный или онлайн-формат: как предпочитают учиться студенты? // Психологическая наука и образование. 2022. Том 27. № 5. С. 5—20. DOI: https://doi.org/10.17759/pse.2022270501

Introduction

The digital transformation of education in Russia is one of the priority areas of the state policy. Higher education institutions are frequently looking for new digital ways to improve the quality of education, increase students' engagement and manage knowledge resources. In assessing the effectiveness of training, it seems important to overcome the dichotomy of choosing online education and traditional full-time education and draw special importance to blended learning, which in many ways unites the past and the future in education [2; 7; 10]. The report [3] at the II All-Russian Conference with international participation "Digital Humanities and Technologies in Education (DHTE 2021)" notes that, according to the annual monitoring of the education economy for 2020—2021, implemented by the National Research University Higher School of Economics, the educational process at Russian universities in 2020-2021 has undergone a major transformation: digitalization processes have unfolded at a faster pace, new models of training courses have begun to be mastered (blended learning, learning using MOOCs), and a large number of new digital technologies are used at universities. Accelerated digitalization of the educational process is seen in the report as a growing window of opportunity. At the same time, in the implementation of blended and distance learning formats, the key challenges for students are the problems of self-regulation and use of learning technologies. On behalf of educational institutions, the main problem is to provide support for teachers in the learning process [20].

According to the results of studies on the effectiveness of teaching mathematical methods in psychology and education based on electronic learning courses (ELC) conducted at Moscow State University of Psychology and Education in 2019—2021, students of bachelor's, specialist's and master's degrees positively assess mixed and distance formats [11] and, which is very important, show high educational results in both formats [12]. The model of learning based on a blended format also shows its effectiveness in improving the natural scientific literacy of students [19].

Sociological research shows that the way students prefer to study depends, among other things, on the chosen direction of education. So, in 2021 in Russia, IT professions (more than 2.5 million people) and professions in the

field of education (more than 2.2 million people) became the most massive areas in online education. In offline, the most popular areas were manufacturing, construction and repair (more than 1.5 million people studied). In the second place are IT professions and marketing (more than 1.4 million people) [4]. At the same time, one of the significant goals of education is the ability of the students themselves to assess the relevance of scientific knowledge and practices, and use them in solving a wide range of personal and social problems.

In the context of the ongoing COVID-19 pandemic, the scientific literacy of citizens is turning from a subject of sociological research into a question of the survival of the society itself due to the attitude of various social groups and individuals towards the issues of disease prevention and vaccination. This ratio reflects the real state of scientific literacy and reveals significant problems in its formation [8]. Presumably, the position regarding COVID-19 vaccine prevention, which may be associated with the ability to critically analyze large amounts of conflicting information of a natural science nature in order to evaluate it and select the most reliable sources, as well as the general level of intellectual development, and fear of infection with coronavirus, may be associated with the choice of educational format for university students. Indeed, the student audience is the most active social group in terms of communication, which is one of the risk factors for the spread of the virus during the COVID-19 pandemic.

The attitude of university students to the transition to distance forms of education during the COVID-19 pandemic is becoming the subject of numerous studies. Thus, on the example of studying the attitude of future doctors to distance education at Privolzhsky Research Medical University of the Ministry of Health of Russia, it is shown that, taking into account the objective situation, almost all students positively assess the introduction of distance education at the University. At the same time, among the positive features of distance learning, students most often note saving time and money on the road, the comfort of studying at home, the ability to choose the optimal pace of mastering the material [6]. Another example of the attitude of university students to distance education during the COVID-19 pandemic is shown in a study conducted on the basis of the Faculty of Dentistry of Altai State Medical University of the Ministry of Health of Russia. A survey of students showed that, in general, they are satisfied with the distance learning process, highly appreciating the content and presentation of educational information. Problems and difficulties that arise during the development of educational programs are mainly related to technical issues. However, according to the majority, distance learning cannot fully cover the practical part of the training of a future doctor, and the distant format can only be considered as an alternative to traditional education in the context of the COVID-19 pandemic [13]. At the same time, the overall level of satisfaction with distance learning in medical universities is much higher among students who have had previous distance learning experience, as well as when teachers actively participate in training sessions, using multimedia technologies and devoting sufficient time to classes [14]. In a review of the digitalization of medical education in Germany, S. Kuhn et al. [18] emphasizes the growing relevance of mobile, interactive and personalized formats and digital learning platforms.

The purpose of the study: to identify the characteristics of respondents who prefer different formats of education, regarding their age, development of intelligence and natural science literacy, as well as their attitude to vaccination against COVID-19.

Research questions:

RQ1: In the context of the COVID-19 pandemic, how do students feel about different formats of learning, and what might these preferences be related to?

RQ2: What are the generalized characteristics of respondents who prefer different learning formats?

RQ3: Which of the parameters of attitudes towards COVID-19 vaccination and the intellec-

tual sphere can be predictors of respondents' preference for one of the learning formats?

Materials and Methods

Description of the study design. Students of Moscow State University of Psychology and Education (hereinafter referred to as MSUPE) took part in the study. As part of the verification of the program of educational activities in the field of COVID-19 vaccine prevention, the attitude of students to vaccination against COVID-19 infection was studied in conjunction with their natural science literacy and other characteristics. The data was collected in February and March 2022. The study was approved by the Ethics Committee of the MSUPE (Protocol No. 8 dated December 15, 2021). Testing was carried out anonymously in computer form by the Department for Monitoring the Quality of Vocational Education (DMQVE) MSUPE. Participation in testing was voluntary, students gave informed consent.

Description of the sample. The sample consisted of N=761 bachelor's, specialist's and master's students of Moscow State University of Psychology and Education, who, in addition to other tests, filled out the Questionnaire on attitudes towards vaccination against COVID-19 before and after the formative experiment: of them, men — 19.2% (N=146), women — 80.8% (N=615). In the process of calculations, the sample size could decrease, because not all students completed the entire battery of tests.

At the ascertaining stage, the question was asked: "What format of training is preferable for you after January 31 with the improvement of the epidemiological situation? (Single Choice)." Among N=761 respondents of the analytical sample, 10.8% (N=82) students chose the face-to-face format (FTF), blended format (lectures — in a distant format, seminars, practical classes — full-time) (BF) — 39.7% (N=302), distant format (DF) — 49.5% (N=377). Comparison of the distributions of men and women according to the 3 preferred training formats (groups FTF, BF and DF) did not reveal any differences (Chi-square, p=0.127). Distribution of male respondents in 3 groups — 14.4% vs 33.6% vs 52.1%, women — 9.9% vs 41.1% vs 48.9%. Thus, among respondents of both sexes, about 50% choose DF, about 35%—40% — BF, and about 10%—15% — FTF. Comparison of 3 groups by age, see below (Table 1).

Diagnostic tools

1. A Questionnaire on Attitudes towards Vaccination against COVID-19, including 34 statements with response options on a Likert scale from 1 (strongly disagree) to 7 (strongly agree). Based on this questionnaire, a standardized questionnaire "Scale of Attitudes towards Vaccination against COVID-19" was developed [9].

2. Adapted and modified TOSLS Test for Assessing Science Literacy [17].

3. A Test for Assessing Logical Thinking — Raven's Test (abbreviated version of "Advanced Progressive Matrices by J. Raven") [16].

4. Test for Assessing Verbal Intelligence (created on the basis of the Amthauer intelligence structure test) [1].

5. COVID-19 Disease Fear Scale [15], Russian translation and adaptation by T.L. Kryukova and others [5].

Methods for quantitative data analysis: descriptive statistics, one-way ANOVA, Chi-square homogeneity test, Kolmogorov-Smirnov test, exploratory factor analysis, k-means cluster analysis, logistic regression analysis. Quantitative data analysis was performed in SPSS V.23.

Results

Determination of aspects of attitude to vaccination. To study the effectiveness of the formative experiment on the initial sample of N=1984 students who filled out the Questionnaire for Attitudes towards Vaccination against COVID-19 at the entrance, exploratory factor analysis (EFA), the method of principal components, Varimax rotation was carried out for 34 items of this Questionnaire. Five factors explaining respectively 22.3%, 11.7%, 11.1%, 9.35 and 6.6% of the total variance, in the amount of 61.1% were identi-

fied. The values of KMO=0.961 and Bartlett's sphericity criterion (Chi-square=41241.015, df=561, p=0.000) indicate good factorizability of the correlation matrix. Based on the matrix of rotated components and factor loadings of the Questionnaire items, the factors were interpreted as 5 scales reflecting various aspects of attitudes towards vaccination: Scale 1 "Benefits of covid vaccination for humans and society" (10 points), Scale 2 "Denial of the danger of coronavirus and hope for natural immunity" (8 points), Scale 3 "Fear of the side effects of COVID-19 vaccination and distrust of information about the safety of vaccination" (7 points), Scale 4 "Confidence in the serious negative consequences of the coronavirus vaccine" (5 points), Scale 5 "Disbelief in the proven effectiveness of Russian vaccines at the international level" (4 points).

The evaluation of differences between 3 groups of respondents who prefer different formats of education were assessed on 5 selected aspects of attitudes towards vaccination and 4 measured parameters — SLT, indicators of intelligence and fear of COVID-19 disease.

Table 1 presents descriptive statistics and results of analysis of variance (1-way ANOVA). Statistically significant differences were revealed for 5 measured parameters (bold in Table 1): age, logical thinking (Raven Test), Science Literacy Test (SLT), COVID-19 Disease Fear Scale, Verbal Intelligence Test (VI). Different sample sizes are explained by the fact that not all students completed all of the listed tests.

Table 1

Descriptive statistics and ANOVA results for measured parameters for 3 preferred learning formats

		N	M	SD	St. Error	Min	Max	F	p
Age	FTF	82	21.59	5.62	.621	18.00	53.00	3.538	.030*
	BF	302	22.61	7.09	.408	17.00	53.00		
	DF	377	23.63	7.37	.380	17.00	56.00		
	Total	761	23.01	7.12	.258	17.00	56.00		
Logical Thinking Evaluation Test — Ravens' Test	FTF	78	7.33	2.92	.331	1.00	12.00	6.864	.001***
	BF	294	**7.81**	2.81	.164	0.00	12.00		
	DF	352	**6.97**	2.95	.157	0.00	12.00		
	Total	724	7.35	2.92	.108	0.00	12.00		
Scientific Literacy Test — SLT	FTF	79	15.45	5.23	.588	4.00	27.00	4.124	.017*
	BF	293	**16.25**	4.65	.271	5.00	27.00		
	DF	356	**15.17**	4.87	.258	4.00	25.00		
	Total	728	15.64	4.84	.179	4.00	27.00		
COVID-19 Disease Fear Scale	**FTF**	80	**12.61**	4.22	.472	700	24.00	3.881	.021*
	BF	289	13.30	4.32	.254	7.00	29.00		
	DF	344	**14.04**	5.12	.276	7.00	35.00		
	Total	713	13.58	4.73	.177	7.00	35.00		
Verbal Intelligence Test (VI)	FTF	76	24.80	9.34	1.07	4.00	39.00	5.790	.003**
	BF	282	**26.21**	9.19	.547	0.00	39.00		
	DF	338	**23.62**	9.71	.528	1.00	40.00		
	Total	696	24.80	9.53	.361	0.00	40.00		

Notes: * p<0.05, ** p<0.01, *** p<0.001.

The post hoc method of paired comparisons according to Scheffe does not reveal age differences. Let's pay attention (see Table 1) that the age range for all 3 groups is almost the same — from 17—18 to 53—56 years. In the BF group, compared to the DF group, logical thinking is slightly better developed (7.81>6.97, p=0.001), the SLT test scores are higher (16.25>15.17, p=0.018), and verbal intelligence is better developed (26.21>23.62, p=0.003). In the FTF group, compared with the DF group, the fear of COVID-19 disease was lower (12.61<14.04, p=0.050). However, the size of the Cohen effect d is everywhere small and does not exceed 0.3. No other pairwise differences were found.

Table 2 presents descriptive statistics and results of analysis of variance (1-way ANOVA) for 5 scales that characterize the attitude of respondents to vaccination against COVID-19. Statistically significant differences (highlighted in bold) were found only on Scales 1 and 4 (p=0.004, p<0.01).

Scheffe's post hoc pairwise comparison method reveals the following differences (see Table 2, in bold). In the BF group, compared to the DF group, scores are higher on Scale 1 "Benefits of COVID-19 vaccination for the individual and society" (41.80>38.53, p=0.016) and lower scores on Scale 4 "Confidence in the serious negative consequences of the coronavirus vaccine" (12.90<14.34, p=0.005). In the FTF group, compared with the DF, the scores on Scale 1 "Benefits of vaccination against COVID-19 for the individual and society" are higher (42.92>38.53, p=0.050). This is quite consistent with common

Table 2

Descriptive statistics and ANOVA results on scales 1—5 of the COVID-19 vaccination attitude questionnaire for 3 preferred learning formats

Scale/Group		N	M	SD	St. Error	Min	Max	F	p
Scale 1	FTF	82	**42.92**	13.54	1.496	10.00	70.00	5.602	.004**
	BF	302	**41.80**	14.73	0.847	10.00	70.00		
	DF	377	**38.53**	14.88	0.766	10.00	70.00		
	Total	761	40.30	14.77	0.535	10.00	70.00		
Scale 2	FTF	82	27.12	10.53	1.163	10.00	56.00	2.444	.088
	BF	302	25.33	9.75	0.561	8.00	54.00		
	DF	377	26.96	10.30	0.530	8.00	55.00		
	Total	761	26.33	10.13	0.367	8.00	56.00		
Scale 3	FTF	82	29.15	8.18	0.903	13.00	48.00	.867	.421
	BF	302	28.26	8.50	0.489	7.00	49.00		
	DF	377	29.09	8.81	0.453	7.00	49.00		
	Total	761	28.76	8.62	0.312	7.00	49.00		
Scale 4	FTF	82	13.41	5.78	0.638	5.00	35.00	5.502	.004**
	BF	302	**12.90**	5.49	0.316	5.00	29.00		
	DF	377	**14.34**	5.78	0.297	5.00	30.00		
	Total	761	13.67	5.70	0.206	5.00	35.00		
Scale 5	FTF	82	15.19	5.65	0.624	4.00	26.00	1.100	.333
	BF	302	15.43	5.42	0.312	4.00	28.00		
	DF	377	15.96	5.56	0.286	4.00	28.00		
	Total	761	15.66	5.52	0.200	4.00	28.00		

Notes: ** p<0.01.

sense.

Generalized characteristics of respondents who prefer different learning formats. For the purpose of a generalized characterization of 3 groups — FTF, BF and DF — multivariate statistical methods were applied. **Cluster analysis using the K-means** method with preliminary standardization of all variables made it possible to divide the respondents into 2 clusters according to the total number of independent variables, which were: the SLT test, the Test for Logical Thinking Assessing — the Raven test, the Test for Verbal Intelligence and Scales 1—5 of the Attitude Questionnaire to Vaccination against COVID-19. The addition of the COVID-19 Fear Scale to this battery did not affect the results and would not add anything to their interpretation, as there were no differences between clusters in this parameter. Evaluation of the differences between the resulting clusters in terms of clustering parameters made it possible to characterize them as a whole. Then a comparison was made of the distributions of respondents in both clusters according to the preferences of various formats of education and interpretation of the results was given. Table 3 shows descriptive statistics of both clusters by clustering parameters.

The Mann-Whitney test revealed significant differences in all clustering parameters ($p<0.001$ everywhere). In Cluster 1 (see Table 3), perceptions are higher in the Logical Thinking Test (8.21>6.53), the NSL test (17.75>13.86), the Verbal Intelligence Test (28.29>21.70). Scale 1 "The use of COVID-19 vaccination for the individual and society" (49.55>31.88) and a decrease below on Scale 2 "Denial of a health hazard and hope for natural immunity" (18.99<33.12), Scale 3 "Fear of side effects of vaccination against COVID-19 infection and distrust of information about the safety of vaccination" (23.29<33.96), Scale 4 "Confidence in the serious negative consequences of the

Table 3

Descriptive statistics of clusters 1 and 2 by clustering parameters

Cluste Number		Logicla Thinking Test — Raven's Test	SLT	VI	Scale 1	Scale 2	Scale 3	Scale 4	Scale 5
Cluster 1	M	**8.21**	**17.75**	**28.29**	**49.55**	18.99	23.29	9.52	12.04
	N	328	328	328	328	328	328	328	328
	SD	2.63	4.11	7.99	12.17	6.37	6.58	3.38	4.60
	St. Error M	.145	.227	.441	.672	.351	.363	.187	.254
	E	0.045	0.180	0.587	0.241	0.560	-0.044	0.289	-0,655
	A	-0.670	-0.577	-1.112	-0.375	0.516	0.118	0.728	0,114
Cluster 2	M	6.53	13.86	21.70	31.88	**33.12**	**33.96**	**17.41**	**18.88**
	N	362	362	362	362	362	362	362	362
	SD	2.99	4.73	9.58	11.64	8.20	7.19	4.75	4.17
	St. Error M	0.157	0.248	0.503	0.612	0.431	0.378	0.250	0.219
	E	-0.781	-0.706	-0.955	-0.157	0.119	-0.397	0.691	-0.315
	A	-0.251	0.083	-0.222	0.004	0.511	0.025	0.397	0.081
Total	M	7.33	15.71	24.83	40.28	26.40	28.88	13.66	15.63
	N	690	690	690	690	690	690	690	690

vaccine against the disease" (9.52<17.41) and Scale 5 "Disbelief in assessing the effectiveness of the Russian vaccine at the international level" (12.04<18.88). No differences were detected between clusters by age (p=0.527). Thus, **Cluster 1 — respondents with more developed thinking, verbal intelligence, better NSL, better understanding of the use of COVID-19 vaccination for the individual and society and less presumed by widespread fears, doubts, underestimation of the danger of COVID-19 and distrust of vaccination.**

Comparison of distributed respondents of cluster groups according to preferences of different formats is presented in Table 4.

As can be seen from Table 4, in Cluster 1 in comparison to Cluster 2, the share of respondents who prefer BF prevails by 7.3% (44.4% vs 37.1%), and the share of those who prefer DF is 8.8% less (43.8% vs 52.6%). The differences are significant at the tendency level (Chi-square=5.185, p=0.075, p<0.1). Note that in both clusters, the shares of supporters of the BF and DF significantly prevail compared to the FTF. The shares of respondents who prefer FTF are practically the same and make up only about 10%.

The study of predictors of respondents' preference for learning formats using the method of logistic regression analysis (LRA). LRA was applied to answer research question RQ3: Which of the measured parameters can be predictors of respondents' preference for one of the learning formats?

Blended Format (BF) vs Distant Format (DF). As independent variables, the analysis included: Age, Logical Thinking (Raven Test), NSL, Verbal Intelligence Test, COVID19 Disease Fear Scale, Scales 1—5 of the COVID-19 Vaccine Attitude Questionnaire. All independent variables are quantitative. Dependent variable: "Preferred learning format" is binary, it takes the values "BF=0" and "DF=1". Sample size N=589 respondents who chose one of these 2 formats and completed the entire battery of the indicated tests.

A logistic model with 4 statistically significant predictors was built, which is described by the equation:

Predicted logit of (Preferred learning format) = 0.212 + (0.025)*(Age) + (-0.080)*(Raven's Logical Thinking Test) + (0.048)*(COVID-19 Fear Scale) + (-0.017)*(Scale 1 "The benefits of vaccination against covid for the individual and society").

According to this model, the logarithm of the values of the dependent variable is positively associated with age (B=0.025, p=0.040, p<0.05) and fear of COVID-19 (B=0.048, p=0.011, p<0.05) and negatively with logical thinking (B=-0.080, p=0.006, p<0.01) and with the idea of the benefits of vaccination against COVID-19 for the individual and society (B=-0.017, p=0.004,

Table 4

Distribution of respondents in clusters 1 and 2 according to the 3rd preferred learning formats

Cluster Number		Preferred training format after January 31 when the epidemiological situation improves (Single choice)			Total
		FTF	BF	DM	
Cluster 1	Quantity	38	144	142	324
	% in Cluster Number	11.7%	**44.4%**	43.8%	100.0%
Cluster 2	Quantity	36	130	184	350
	% in Cluster Number	10.3%	37.1%	**52.6%**	100.0%
Total	Quantity	74	274	326	674
	% in Cluster Number	11.0%	40.7%	48.4%	100.0%

p<0.01). In other words, the older the respondent, the more pronounced his fear of COVID-19, the lower his logical thinking, and the less confident he is in the benefits of vaccination against COVID-19 for the individual and society, the more likely he is to prefer DF over BF. Conversely, BF is more likely to be preferred over DF by younger respondents with higher logical reasoning scores, less fear of COVID-19, and greater confidence in the benefits of COVID-19 vaccination for the individual and society.

The Hosmer-Lemeshev fit coefficient of the model (Chi-square=12.886, df=8, p=0.116, p>0.05) is not statistically significant, which indicates a good fit. R-square of Cox and Snell is 0.046, R-square of Nagelkirk is 0.061, which may indicate a low percentage of variance of the dependent variable explained by the selected predictors.

Table 5 presents a classification table that reflects the ratio of cases of assigning respondents to one of the BF or DF formats correctly predicted by this model compared to the observed elections.

As can be seen from Table 5, the sensitivity of the model (70.7%) is higher than its specificity (48.5%). This means that the model correctly predicts the choice of the distant format (DF) 70% of the time, which is a very high result, but slightly less than 50% of the time it predicts the choice of the blended format (BF). Perhaps this is due to the fact that BF students often consider DF as the prevalence of online interaction, as their comments indicate. The overall prediction accuracy of the model is 60.4%, which is higher than the probability of random guessing. In general, the model should be considered satisfactory.

Attempts to construct similar models for the pairs FTF vs DF and FTF vs BF have failed. The first of them has a very low specificity (i.e., it does not predict belonging to an FTF), in the second model, not a single significant predictor was identified.

An interesting addition to the mathematical models can be the **respondents' comments** (from among MSUPE students) **about their choice of learning format**. They can be divided into three categories. The arguments for the **face-to-face format** are basically quite typical for its supporters in professional and student circles: the quality of education is low online, the face-to-face format is "fine", and it is easy to get distracted at home. Example: "The situation with COVID-19 will definitely not change in the near future. I don't want to spend the entire bachelor's degree at home. Studying at home is much worse (let's be honest at home it's very easy to get distracted). For 2 years at the University, I came to the Uni in person only a few times, I have a feeling that I am not studying at all." There is even a certainty that distance and isolation lead to mental disorders: "You can't keep people locked up, various mental deviations and nervous disorders may develop. In addition, the level of education is decreasing. At the same time, the numbers of sick and dead do not change. Not only do we not increase the number of healthy people, but we also make those who are healthy and who have good immunity sick. Moreover, mentally".

Table 5

Classification table of observed and predicted frequencies of preferred learning formats (BF vs DF) for the constructed LRA model

Observed		Predicted		
		Preferred learning format (BF vs DF)		% of correct predictions
		BF	DF	
Preferred learning format (BF vs DF)	BF	132	140	48.5
	DF	93	224	70.7
Total % share				60.4

Arguments in favor of **the distant format** are also quite typical for the professional and student community: this format is convenient for those students who live far, can not attend classes due to health reasons, family reasons, and it can be easily combined with professional activities of employed students. Here is a lively example of a statement in this category: "Very convenient format. People who study at the University are not children with undeveloped voluntary attention. They can control themselves. The distant format once again confirmed that they [students] listen and are not distracted when the lecture or seminar is interesting. If the teacher is not interesting for students, the information will be lost using any format of education".

Perhaps the most numerous and curious were the comments of the proponents of **the blended learning format**. They offered various options of the mixed format, the most typical of which are practice and trainings — full-time, because they are less effective distantly, and all the rest is distantly. Examples of statements: "I prefer a blended format, but rather like this: lectures and seminars distantly, practice/trainings/etc. in full-time (what is really worse realized distantly)"; "Maximum distant, but practice and individual meetings with teachers, practical classes, group training — only in person". Among the statements there were proposals to distribute time between face-to-face and distant formats: "50 to 50, a week of face-to-face classes, a week of distant classes"; "90% distance, 10% face-to-face". Some respondents linked the choice of the format to the field of study and level of education: "Three times a month, face-to-face practical classes to add some rhythm to life, but distant learning is a more preferable option at the University. One should also take into account the areas of training, there are training areas and tracks where face-to-face meetings will really be required more often", "Master's degree distantly, bachelor's degree full-time".

Discussion

The study showed that the vast majority of university students of both sexes aged 17 to 56 prefer mixed or remote type of learning at a ratio of approximately 40% vs 50%, while full-time format — only about 10%. This is in good agreement with the conclusions of the study [3] and sociological survey [4] about the outstripping pace of digitalization of higher education in Russia and the growing market of online education. In addition, during the two years of the pandemic, students and teachers have learned to use the resources of the digital educational environment and gained extensive experience in the practical implementation of the educational process in both mixed and distant formats.

The formation of natural science literacy contributes to an active position in learning, and the development of critical thinking acts as the main strategy for the development of relevant competencies among students [8]. Students who prefer the mixed format have somewhat better developed logical thinking and science literacy, better understand the benefits of COVID-19 vaccination for the individual and society, and are less afraid of the serious negative consequences of the coronavirus vaccine. In turn, students who choose the face-to-face format show less fear of COVID-19 and are also more aware of the benefits of vaccination against coronavirus compared to those who choose the distant format. This is quite consistent with common sense: if students are aware of all this, then they are likely to be vaccinated, thereby protecting themselves and others from the danger of the disease and expanding the possibilities of contact in any format.

The results of cluster analysis, in general, correspond to the same logic. The first of the two selected clusters are respondents with more developed logical thinking, verbal intelligence, better science literacy, who better understand the benefits of vaccination against COVID-19 for an individual and society and are less prone to various fears, doubts, underestimation of the danger of COVID-19 and distrust

of vaccination. In this Cluster, compared to Cluster 2, the proportion of respondents who prefer BF prevails by 7.3%, and the proportion of those who prefer DF is 8.8% less. Note that in both clusters, the shares of supporters of the BF and DF significantly predominate compared to the FTF. The shares of respondents who prefer FTF are practically the same and make up only about 10%.

The results of logistic regression analysis demonstrate a rather low R-square (about 5-6%) and low prediction accuracy (about 60%). Obviously, preferences for distant or blended learning formats can be determined not only by the predictors used in the model, but also by some other variables not taken into account in the study. The search for such predictors requires further research. Note, however, that in this study we did not aim to identify all possible predictors, and also the fact that in real models using LRA, obtaining an overall prediction accuracy close to 100% with both high sensitivity and specificity is an extremely rare case due to the specifics of phenomena studied in psychology.

The results of this study are consistent with the results of the research project "Digital technologies in HE: development of a technology for individualization of learning by means of E-course", implemented at MSUPE in 2019—2021 [11; 12], and statistically confirming high educational results and positive attitude of students towards both the BF and the DF.

Our results, the results of international and a number of Russian studies, as well as the significant efforts of the Ministry of Digital Development of the Russian Federation and the Ministry of Education and Science of the Russian Federation to develop digital competencies of university teachers who participated in the "Priority 2030" program, allow us to talk about the feasibility of institutionalizing blended and distance learning formats at the University and granting these formats equal rights compared to face-to-face format. The choice of BF or DF should be determined not by the epidemiological situation and / or formal criteria such as "more or less than 30 students in a group", but by a confirmed agreement between the teacher and the deans of specific faculties. Such an agreement is based on other reasons, for example: the level of digital competencies of the teacher and his/her ability to work in a modern digital educational environment; the specifics of the subject; size, accessibility, availability in the university campus of computer classes with the necessary software and statistical packages; the readiness and desire of students of bachelor's, specialist's and master's programs to study in the BF and DF formats; good academic achievements of students and their positive impression of the course in the BF or DF, etc. Given the students' proposals for diversifying the forms of blended learning, such training can be organized very flexibly. We add that in the real educational process at MSUPE, both of these formats are successfully used in practice.

Conclusion

1. According to the results of a survey of the University students on the example of Moscow State University of Psychology and Education (N=761), the distance learning format (49.5%) and the blended format (lectures — in a distance format, seminars, practical classes — full-time) are the most preferable — 39.7%. The face-to-face format is the least in demand (10.8% of respondents). There were no differences between the respondents of these groups by sex and age. The age range in all three groups is almost the same — from 17—18 to 53—56 years.

2. In the group of students who prefer the blended learning format, compared to those who prefer the distance one, logical and verbal thinking is significantly better developed, indicators of natural science literacy are higher, the assessment of the benefits of COVID-19 vaccination for a person and society is higher, and the confidence in the serious negative consequences of the coronavirus vaccine is lower. In the group of students who chose the

face-to-face format, compared to the group who chose the distant format, the fear of COVID-19 was lower.

3. The combination of parameters of attitudes towards vaccination against COVID-19 and the intellectual sphere make it possible to distinguish two clusters of respondents. Cluster 1, compared to cluster 2, is characterized by higher rates of logical thinking, verbal intelligence, science literacy, better understanding of the benefits of COVID-19 vaccination for the individual and society, and less exposure to a variety of fears, doubts, underestimation of the dangers of COVID-19 and lack of confidence in vaccination.

4. In cluster 1, compared to cluster 2, the proportion of respondents who prefer the blended format of education predominates, and the proportion of those who prefer the distance format is smaller. The proportions of respondents who prefer full-time education are practically the same and make up only about 10% of the number in both clusters.

5. Four statistically significant predictors of respondents' choice of a blended or distance learning format were identified. The blended format is more likely to be preferred over the distant format for younger respondents with higher logical thinking scores, less fear of COVID-19 disease, and greater confidence in the benefits of COVID-19 vaccination for the individual and society. The overall prediction accuracy of the model is 60.4%, which is higher than the probability of random guessing. Respondents have different opinions about what a blended format should be.

Restrictions

The limitation of the obtained results is the fact that the distributions in all three groups differ from the normal for almost all measured parameters (Kolmogorov-Smirnov test), with the exception of the NSL test (p=0.097), indicators on Scale 2 (p=0.056), Scale 3 (p=0.075) and Scale 5 (p=0.083) in the FTF group, as well as scores on Scale 1 in all three groups (p=0.200). Note, however, that the sample sizes of BF and DF are about 300 subjects, and with such large sample sizes it is rather difficult to obtain compliance with a normal distribution.

Directions for further research. The study of the prerequisites for students' acceptance of the digital educational environment and predictors of their choice of various learning formats, the inclusion of additional parameters in the model to obtain a more accurate forecast.

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Получена 24.06.2022
Принята в печать 26.08.2022

Received 24.06.2022
Accepted 26.08.2022

Психологическая наука и образование
2022. Т. 27. № 5. С. 21—33
DOI: https://doi.org/10.17759/pse.2022270502
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 21—33
DOI: https://doi.org/10.17759/pse.2022270502
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Academic Motivation in Relation to Burnout Among Russian and Azerbaijani Higher Education Students

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Student burnout is a risk factor for personal well-being and can lead to a decrease in motivation and other crucial components of learning. We present the results of a study of the relationship between academic motivation and burnout in the Russian (N=203) and Azerbaijani (N=170) samples. Motivation profiles were compared to profiles of burnout and study-related experiences. Students from two profiles with the highest level of intrinsic motivation, but different levels of motivation of self-esteem (high — 32% of the total sample, or low — 20%) experienced either no burnout, or high exhaustion along with high meaningfulness of learning in both cases. Students with predominance of external motivation (20%) or amotivation (9%) turned out to be more prone to burnout, showing a high level of emotional exhaustion along with an average or complete loss of the meaning of their own educational activities. Among students with an average profile (18%), the main symptom was a decrease in the meaningfulness of study that was in some cases linked to other symptoms of burnout. The results were similar in both samples, with the profiles with high levels of self-esteem being more typical of female students. The limitations of the obtained results are discussed, as well as the relevance of burnout prevention in universities.

Keywords: academic motivation, burnout, study-related experiences.

For citation: Koyfman A.Y., Hauser A.E. Academic Motivation in Relation to Burnout Among Russian and Azerbaijani Higher Education Students. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2022. Vol. 27, no. 5, pp. 21—33. DOI: https://doi.org/10.17759/pse.2022270502 (In Russ.).

Связь академической мотивации и выгорания у студентов российских и азербайджанских вузов

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Представлены результаты исследования связи академической мотивации и выгорания на российской (N=203) и азербайджанской (N=170) выборках. Авторы исходили из того, что выгорание является серьезной угрозой для психологического благополучия студентов, в том числе для их академической мотивации, поэтому мониторинг мотивации и выгорания является актуальной задачей в любой стране. В данном исследовании профили мотивации сопоставлены с профилями выгорания и переживаний в учебе: студенты с самыми высокими показателями внутренней мотивации, но разным уровнем мотивации самоуважения (высоким — 32% общей выборки либо низким — 20%) показали либо отсутствие признаков выгорания, либо заметное эмоциональное истощение при высокой осмысленности деятельности в обоих случаях; более подверженными выгоранию оказались студенты с преобладанием внешней мотивации (20%) или амотивации (9%), показав высокий уровень эмоционального истощения на фоне средней либо полной потери смысла собственной учебной деятельности; у студентов с невыраженным, усредненным профилем (18%) основным признаком оказалось снижение осмысленности учебы, в ряде случаев сцепленное с другими признаками выгорания. Сходная картина была получена в обеих выборках, причем для девушек более характерны профили с высоким уровнем мотивации самоуважения, а для юношей — наоборот. Обсуждаются ограничения полученных результатов, а также необходимость профилактики выгорания в вузах.

Ключевые слова: академическая мотивация, эмоциональное выгорание, переживания в учебной деятельности.

Для цитаты: *Койфман А.Я., Гаузер А.Э.* Связь академической мотивации и выгорания у студентов российских и азербайджанских вузов // Психологическая наука и образование. 2022. Том 27. № 5. С. 21—33. DOI: https://doi.org/10.17759/pse.2022270502

Introduction

Academic motivation might be viewed as a complex hierarchy of internal and external reasons to study. It comprises intrinsic motives and those related to self-respect and recognition from others, extrinsic motives in-

cluding introjected ones related to social and cultural norms and requirements, and external motives related to expectations and pressure from family members, administrators or other circumstances [2; 18]. Academic burnout is a negative individual experience which can be attributed mostly to emotional exhaustion, cynicism towards learning and self-inefficacy, but also to some other feelings, motives and expectations [6; 15].

In 2020-2021, we witnessed a unique natural experiment. The spread of COVID-19 in Russia in the spring of 2020 caused most of the universities to lock down and the educational mechanism started to adjust to remote management. The first term of the 2020/2021 academic year began with a few attempts to return to full-time education, which did not succeed, and most of the universities had to go back to distance-based education or a mix of both formats. To keep up with their online studies, students had to find appropriate technical resources and relied upon network stability. Well-established interactions between administration, faculty and students were broken. Everyone began to change their ways of teaching, learning and communicating in accordance with the new circumstances. However, students faced difficulties in adaptation for many reasons, including the increase of social deprivation and isolation, and hypodynamia caused by the necessity to spend hours in front of a computer screen. They needed to stay alert while waiting for their turn to be asked questions and feared missing their lessons if their internet connection was unstable. By the second (spring) term, some universities returned to almost normal functioning, while some features of distance learning remained in the educational process.

COVID-19 brought changes to the financial status of many families, led to illness and the loss of relatives and friends, and affected individual health issues; it caused mental and physical stress and challenged students' values and reasons to continue studying. We assumed that the pandemic and its consequences could also expose the full variation of students' academic motivation and burnout. Therefore, we established two goals of the study. First, we aim to describe patterns of academic motivation and patterns of burnout related to study during the COVID-19 pandemic. Second, we will compare those profiles across Russian and Russian-speaking Azerbaijani students.

Higher education in Azerbaijan is similar to that in Russia, given that historically they inherit a common Soviet past. There are universities in Baku, Azerbaijan where training is given in Russian, some even affiliated with Russian university programs. These are not reasons to expect complete similarity in the motivation and burnout profiles of Russian and Azerbaijani students, but we find it reasonable to compare them.

We follow the personal oriented approach, where an analysis of separate types of motivation through different conditions or in different professional and social groups is replaced by an analysis of patterns or profiles of motivation. This approach affords a more complex and personal view of academic motivation [18] as well as burnout [14; 20]. The number and distribution of profiles across the population varies from one study to another: you may find profiles with a predominance of intrinsic motivation or extrinsic motivation, those with medium levels of both, and others with a high level of amotivation on the contrary [3; 4; 17]. Profiles of burnout may additionally include specific scales like study engagement [20], students' interest [11], quality of life [13], or features specific to a certain culture, such as anxiety and negative attitudes toward academic activities in Korean students [12]. Four profiles are common across the studies. They show different proportions of exhaustion, cynicism and self-inefficacy: high levels of all three, high exhaustion with low cynicism or vice versa, and no burnout at all.

Research design

We collected data from November 2020 to April 2021. A total of 373 1st to 4th year students from Baku, Azerbaijan (az, N=170) and several cities in Russia (rus, N=203), all aged 16-24 years (M=19.6, SD=1.5), took part in

the research. Most of the participants were women (az, 72%; rus, 77%). Different educational specializations were represented: social and human sciences (50%), natural and technical sciences (30%) and the rest were mathematics, medicine and art. Participation was voluntary.

We used the Academic Motivation Scale (AMS-rus) by Gordeeva, Sychev and Osin, based on the AMS-C that was developed by Vallerand et al. [5]. The AMS-rus consists of seven scales, including three facets of intrinsic motivation: learning, achievement and self-development motivation; three facets of extrinsic motivation: self-respect, introjected and external motivation; and amotivation. Each is represented by four items, giving a total of 28 items assessed on a 5-point scale.

To assess burnout, we used three questionnaires and modified them for the academic context: Professional Burnout (PB) by Vodopyanova and Starchenkova, based on Maslach and Jackson's model of burnout [1]; the Russian adaptation of Salmela-Aro's School Burnout Inventory (SBI-rus) by Osin [7; 19]; and the Experiences in Activity Questionnaire (EAQ) by Osin and Leontiev [8]. The seven scales were *Exhaustion* (emptiness and loss of energy) and *Reduction of personal achievements* (low evaluation of one's accomplishments, loss of meaning and a reduction of effort put into work) from PB; *Exhaustion, Cynicism* and *Sense of inadequacy* from SBI-rus; and subjective experiences of *Meaning* (level of engagement in wide personally-significant contexts) and *Effort* (relates to effectiveness and achievement of valuable results) from EAQ.

The survey was conducted online via Google Forms. We added some questions about the students' choices of university and specialization, the online learning experience, the difficulty of study, and so on. The platform does not log incomplete forms, so we are unaware of the number of participants who did not succeed in filling out the form.

Our main hypotheses are as follows:

1. Intrinsic motivation and amotivation should be strongly associated with meaningfulness of educational activity, namely cynicism and meaning: high intrinsic motivation is impossible without experiencing the meaning of learning, and amotivation, by definition, manifests itself as a loss of meaning.

2. Extrinsic motivation (primarily introjected and external), and amotivation should be associated with the experience of effort.

3. Complex relationships between academic motivation and burnout will be found after analysis at the level of typical profiles.

Results

Academic motivation of Russian and Azerbaijani students. AMS-rus scales proved to be reliable (see Table 1), except for *External motivation*, which includes one item that did not fit the scale in the Azerbaijani sample. Distributions were skewed: high scores prevailed in the scales of intrinsic motivation, while amotivation had extremely low scores. Scales of extrinsic motivation have negative kurtosis.

The Russian sample showed slightly higher levels of learning motivation than the Azerbaijani sample. Other scales did not differ between the two groups; therefore, we combined them to perform some further analysis.

Academic motivation and burnout relation. PB, SBI-rus and EAQ scales showed satisfactory reliability, except for the scales for *Reduction of personal achievements* (PB, α=0.688) and *Sense of inadequacy* (SBI-rus, α=0.590). After one item was dropped from the first scale, it showed good reliability (α=0.810). The remaining seven items described the student's ability to mediate communication within academic group and between students and faculty, their attitude to help others to study well and their positive point of view. We decided to keep the scale and to change its label to *Personal achievements*. The other scale was excluded from the analysis, so that only two scales from the SBI-rus remained: *Emotional exhaustion* and *Cynicism* both showed reasonable reliability (α=0.744 and α=0.905, respectively).

Principal component analysis of PB, SBI-rus and EAQ scales extracted two factors

Table 1

AMS-rus: Descriptives and Cronbach's α

Motivation Scale	Rus N=203	Az N=170	Total N=373	Cronbach's α		
	M (SD)	M (SD)	M (SD)	rus	az	total
Learning*	15.7 (3.9)	14.3 (4.0)	15.1 (4.0)	0.893	0.891	0.894
Achievement	14.4 (4.4)	13.4 (4.1)	14.0 (4.3)	0.919	0.887	0.906
Self-development	14.8 (4.5)	15.1 (4.0)	14.9 (4.3)	0.887	0.876	0.882
Self-respect	13.5 (4.9)	13.0 (4.9)	13.3 (4.9)	0.874	0.881	0.877
Introjected	11.6 (4.5)	12.0 (4.0)	11.8 (4.3)	0.782	0.683	0.739
External	10.3 (4.2)	10.8 (4.0)	10.5 (4.1)	0.713	0.621	0.673
Amotivation	8.0 (4.7)	8.2 (4.6)	8.1 (4.6)	0.892	0.893	0.892

Note. * significant difference between two groups: $t(371)=3.632$, $p<0.001$, $\eta^2=0.034$.

(meaning and effort) without emotional exhaustion as an independent factor (see Appendix). In order to keep a more complete view of the data, we decided to include all six scales. We did not obtain any significant differences between correlation matrixes of the academic motivation and burnout scales in the Russian and Azerbaijani samples, so we combined them together (Table 2).

The scales of intrinsic motivation and *Amotivation* similarly correlated with the scales of burnout and experience in learning, except for the sign. The strongest association between *Learning* motivation and *Amotivation*, on the one hand, and *Cynicism* and *Meaning*, on the other hand, indicates that the meaningfulness of learning is essential to all four of them. *Amotivation* had a mildly positive correlation with *Exhaustion* and a negative correlation with *Personal achievements*. For the scales of intrinsic motivation, these associations are opposite and weaker. Notably, the *Achievement* and *Self-development* motivations were more related to *Personal achievements* than *Learning* motivation. Neither intrinsic motivation scales nor *Amotivation* were correlated with the experience of *Effort*.

Scales of extrinsic motivation weakly were correlated with *Effort*. Except for that, *External* and *Introjected* motivation showed a pattern of associations with burnout that is similar to that of *Amotivation,* although less pronounced: they are positively associated with both scales of *Exhaustion* and with *Cynicism*, and *External* motivation was negatively associated with *Personal achievements*. On the contrary, the motivation of *Self-respect* showed significant positive correlations with *Personal achievements* and the experience of *Meaning*, and it had a small negative correlation with *Cynicism*, which makes it similar to the intrinsic motivation scales.

In accordance with our hypotheses, meaningfulness of learning correlated with intrinsic motivation and amotivation, and the experience of effort solely correlated with extrinsic motivation. Self-respect is a special type of motivation: it relates to meaningfulness of learning slightly less than intrinsic motivation, but it is uniquely independent from exhaustion.

Academic motivation profiles. K-means cluster analysis divided the sample into five groups[1] (Figure 1). The profiles names are arbitrary; they match the scales with highest scores within the group. In order of decreasing intrinsic motivation:

1. The high intrinsic motivation and high Self-Respect profile (HighIM_HighSR, 32.2%)

[1] The number of clusters was defined by the results of Ward hierarchical clustering (Euclid-squired distance). The same procedure was used for burnout scales clustering.

Table 2

Correlations between AMS-rus and burnout (Pearson R, N=373)

Scales	8	9	10	11	12	13
Academic motivation scales (AMS-rus)						
1. Learning	-.371**	.373**	-.266**	-.654**	.714**	.067
2. Achievement	-.394**	.462**	-.334**	-.544**	.646**	-.040
3. Self-development	-.372**	.514**	-.265**	-.541**	.692**	.059
4. Self-respect	-.013	.255**	.033	-.205**	.395**	.239**
5. Introjected	.216**	-.054	.256**	.184**	-.084	.308**
6. External	.436**	-.268**	.375**	.485**	-.443**	.231**
7. Amotivation	.533**	-.400**	.415**	.825**	-.756**	.092
Burnout						
8. Exhaustion (PB)	1					
9. Personal achievements (PB)	-.469**	1				
10. Exhaustion (SBI-rus)	.719**	-.357**	1			
11. Cynicism (SBI-rus)	.613**	-.414**	.543**	1		
Experiences in Activity Questionnaire (EAQ)						
12. Meaning	-.446**	.535**	-.326**	-.737**	1	
13. Effort	.338**	-.087	.417**	.121*	.054	1

Note. ** p<0.001, * p<0.05 (2-sided).

showed an average level of introjected motivation and the lowest scores of amotivation.

2. The high intrinsic motivation and low Self-Respect profile (HighIM_LowSR, 20.1%) showed slightly lower scores on the intrinsic motivation scales compared to the first one, low extrinsic motivation and amotivation.

3. The high extrinsic motivation profile (HighEM, 20.4%) combined slightly below average scores of intrinsic motivation with relatively high extrinsic motivation, including the highest level of introjected motivation among the profiles and above average amotivation.

4. The indistinct motivation profile (Indistinct, 18.2%) united students with similar scores across all scales: lower intrinsic and self-respect motivation, and average introjected motivation, external motivation and amotivation.

5. The high external motivation and amotivation profile (HighEx_HighAm, 9.2%) mirrors the first one; it shows the lowest scores of intrinsic motivation and highest scores of external motivation and amotivation.

We compared the proportion of profiles of academic motivation in the Russian and Azerbaijani samples as well as in male/female groups (see Table 3). Profiles with high intrinsic and extrinsic motivation were slightly more frequent in the Russian sample, whereas the Indistinct profile was much more typical in the Azerbaijani sample ($\chi^2(4)=9.882$, $p=0.042$).

Comparing the academic motivation of males and females could be complicated due to large difference in the sample sizes. Analysis of the profiles solved this problem and revealed significant differences between the two samples. The direction of the differences was the same in the Russian ($\chi^2(4)=10.841$, p=0.028) and Azerbaijani ($\chi^2(4)=15.236$, p=0.004) samples, but they varied in extent. We found the profiles with a higher level of motivation of self-respect to be more common for female students, with both pronounced intrinsic (HighIM_HighSR, az) and pronounced extrinsic motivation (HighEM, rus). On the contrary, the profiles with lower scores on motivation of self-respect were more common for

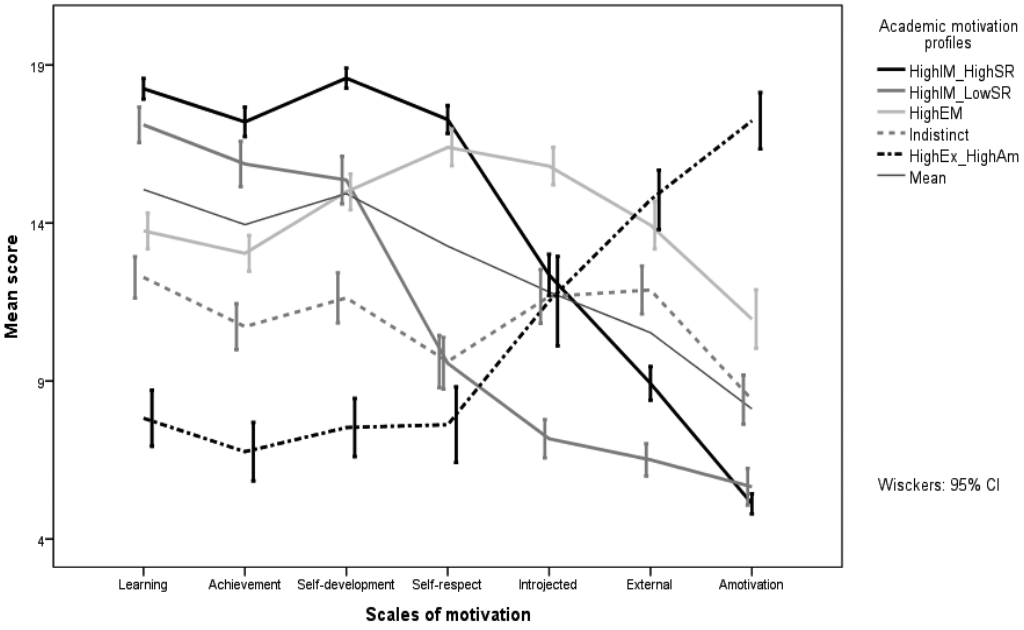

Figure 1. Five cluster profiles of AMS-rus: Means and Cis

Table 3

Distribution of academic motivation profiles in Russian and Azerbaijani male and female samples (columns represent percentage of sample size, N)

Academic motivation profile	Sex		Total
	Female	Male	
Rus			
HighIM_HighSR	34.0	31.9	33.5
HighIM_LowSR	19.9	34.0	23.2
HighEM	26.3	6.4	21.7
Indistinct	11.5	17.0	12.8
HighEx_HighAm	8.3	10.6	8.9
N	156	47	203
Az			
HighIM_HighSR	37.7	12.5	30.6
HighIM_LowSR	14.8	20.8	16.5
HighEM	20.5	14.6	18.8
Indistinct	18.9	39.6	24.7
HighEx_HighAm	8.2	12.5	9.4
N	122	48	170
Total N	278	95	373

male students, especially in Indistinct (az) and HighIM_LowSR (rus) profiles, but also in the profile with high external motivation and amotivation (HighEx_HighAm).

We suggest that these results indicate the existence of some factors which are not registered in the present study, but which might be important for explaining the differences between students. These are social factors such as social expectations and requirements that differ between boys and girls and between men and women, and that may come from family, friends, the media or faculty members and administration; they affect one's learning behavior and attitude towards education.

Burnout[2] **profiles.** We used the same analysis as for AMS-rus to cluster students by their scores on the PB, SBI-rus and EAQ (Figure 2). All of the scales were transformed to make them comparable within a 0- to 100-point scale without standardization of variance. For every scale, the formula was: $100*(x_i\text{-min})/(\text{max-min})$, where x_i is a personal score on the X scale, min is the minimum score of X, and max is the maximum score of X.

Scales that communicate the meaningfulness of learning (*Cynicism* from SBI-rus and *Meaning* from EAQ) appeared to be the most important for clustering. Scales of exhaustion were also important, and the least important role in differentiation was played by *Effort* (EAQ) and *Personal achievement* (PB). K-means revealed five clusters:

1. A burnout-free profile (No_B, 28.4%) gathered the students with the highest meaningfulness of learning, a low level of exhaustion and an average experience of effort.

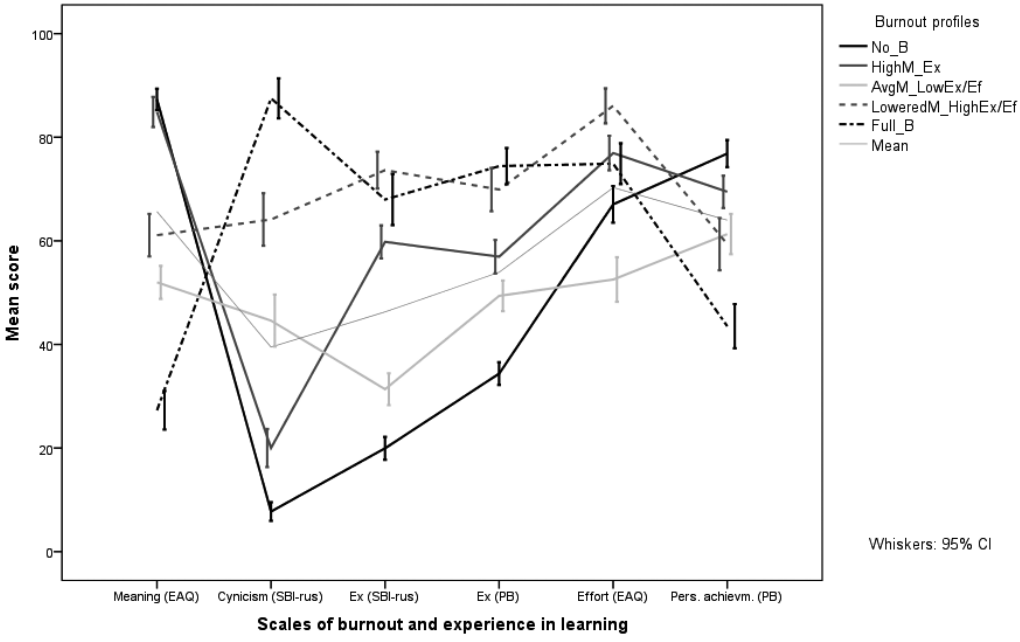

Figure 2. Profiles of burnout and experience in learning: Means and CIs. Ex: exhaustion

[2] We labeled all measures of burnout and experience in learning under one label of burnout in order to simplify the description of results. Nevertheless, we fully understand that this label is applied to a continuum of states, from shallow signs of burnout to severe burnout, a decease [21]. We use the terms high/low burnout to address relative differences between the profiles.

2. A high meaningfulness and exhaustion profile (HighM_Ex, 19.8%) united students with higher levels of exhaustion and effort compared to the first profile.

3. An average meaningfulness and below average exhaustion and effort profile (AvgM_LowEx/Ef, 19.8%) showed the lowest scores of effort experience.

4. A lowered meaningfulness and high exhaustion and effort profile (LoweredM_HighEx/Ef, 14.7%) showed the highest scores of effort experience, unlike the previous profile.

5. A low meaningfulness and high exhaustion profile (Full_B, 17.2%) had the most extreme levels of burnout in the sample, except for the *Effort* scale.

The profiles of academic motivation and burnout showed high consistency, both in the Russian ($\chi^2(16)=145.687$, $p<0.001$) and Azerbaijani samples ($\chi^2(16)=130.369$, $p<0.001$); see Table 4. The high intrinsic motivation and self-respect profile is related mostly to the profiles with no burnout or with considerable exhaustion (No_B and HighM_Ex). The high intrinsic motivation with low self-respect profile showed similar but lower associations, and it also co-occurred with the AvgM_LowEx/Ef profile. More than half of the cases of the extrinsic motivational profile demonstrated high levels of exhaustion and effort experience, with more or less lowered meaningfulness of learning. Students with the Indistinct profile of academic motivation divided into two main groups: those who do not put much effort into study (AvgM_LowEx/Ef burnout profile), and those who study harder and experience a drop in meaningfulness, relatively high exhaustion and effort, and who nevertheless might not get the desirable results (LoweredM_HighEx/Ef). The group of students from the last profile of academic motivation associated with external and amotivation showed 80-90% overlap with the group of students who demonstrated the full picture of burnout (Full_B).

Table 4

Contingency tables of motivational and burnout profiles in Russian and Azerbaijani samples (rows show percentage of subsample size, N)

Academic motivation profile	No_B	HighM_Ex	AvgM_ LowEx/Ef	LoweredM_ HighEx/Ef	Full_B	N
Rus						
HighIM_HighSR	51.5	30.9	11.8	5.9	0.0	68
HighIM_LowSR	42.6	25.5	21.3	6.4	4.3	47
HighEM	9.1	11.4	15.9	36.4	27.3	44
Indistinct	3.8	11.5	34.6	30.8	19.2	26
HighEx_HighAm	0.0	0.0	5.6	5.6	88.9	18
% (burnout)	29.6	20.2	17.2	15.8	17.2	203
Az						
HighIM_HighSR	51.9	38.5	5.8	3.8	0.0	52
HighIM_LowSR	46.4	21.4	21.4	7.1	3.6	28
HighEM	6.3	15.6	25.0	28.1	25.0	32
Indistinct	9.5	4.8	45.2	23.8	16.7	42
HighEx_HighAm	0.0	0.0	18.8	0.0	81.3	16
% (burnout)	27.1	19.4	22.9	13.5	17.1	170

Discussion

The overall picture shows that emotional exhaustion can manifest itself along with any motivational dominant, even if it is a predominance of intrinsic motivation. The trend we see is that the less meaningful and more externally driven the students' motivation is, the higher the risks of burnout they face. In the context of burnout, we get a clue to understanding the motivation of students with the Indistinct motivational profile. Apparently, this group unites those who study more or less meaningfully without making any special efforts and without experiencing emotional exhaustion, and those who put a lot of effort and emotional resources into study without a clear understanding of its purpose. This distinction needs to be tested.

We see that over half of the students across different profiles of academic motivation experience exhaustion. There is only a small number of students with the full picture of burnout and negative academic motivation, namely high external motivation and amotivation. Nevertheless, we suggest that some steps need to be taken to reduce this number: 1) improvement in the quality of career guidance and the presentation of universities in schools to reduce the number of students who "feel out of place", and 2) systematic prevention of burnout in universities, which involves working not only with students but also with faculty and staff, and in some cases implies the need for organizational changes.

The Russian and Azerbaijani samples differ firstly by the ratio of different motivational profiles in the male/female subsamples, and secondly by the prevailing combinations of motivation and burnout profiles. For a more detailed analysis of these differences, we need to conduct additional research, which should take into account evidence of both the similarity [16] and differences between the two cultures [9; 10].

Limitations of the study: a) we used only self-report methods, with no control for the social desirability effect; and b) stress related to burnout could be caused by stressors other than learning, such as the pandemic or the war in Nagorno-Karabakh. Furthermore, data were collected from volunteers, which questions the representativeness of the sample, especially concerning the male/female proportion. We do not have any information about the students' universities and specializations, and thus we cannot identify the real proportion of the profiles in the population, and therefore we do not know how widespread burnout may be among students.

Conclusions

We described profiles of academic motivation and burnout and their co-occurrence. In our study, we cannot explain the prevalence of different profiles in the Russian and Azerbaijani student samples or in the male and female groups; thus, these differences should be addressed in future studies.

1) The results support our initial hypothesis that the meaningfulness of learning is the key factor in the opposition between intrinsic motivation and amotivation.

2) Extrinsic motivation is associated with the experience of effort.

3) One profile of motivation can be associated with different levels of burnout, especially exhaustion. The more extrinsic motivation or amotivation prevail in a profile, the more severe the burnout.

4) The presence of emotional exhaustion does not depend on the prevailing motivation, and this allows us to put forward a hypothesis that its sources are different with the predominance of intrinsic motivation and with the predominance of extrinsic motivation.

The experience of both single and multiple signs of burnout that is common to a large number of students emphasizes the importance of preventing burnout syndrome, while the high level of amotivation can be considered as one of the important markers of burnout.

Appendix

PCA with Varimax rotation was performed on the PB, SBI-rus and EAQ scales. It shows good two factor structure (KMO 0.733, $\chi^2(15)=1018.638$, $p<0.001$), see table A1.

Table A1

Factor loadings on PB, SBI-rus and EAQ scales after rotation

Scale (questionnaire)	F1	F2
Exhaustion (PB)	**-0.614**	**0.626**
Personal achievements (PB)	**0.712**	-0.127
Exhaustion (SBI-rus)	**-0.463**	**0.742**
Cynicism (SBI-rus)	**-0.835**	0.246
Meaning (EAQ)	**0.905**	0.059
Effort (EAQ)	0.139	**0.872**

The first factor explained 44% of variance and consisted of the scales related to meaningfulness of learning. The second factor was mainly defined by experience of effort (EAQ) and exhaustion, it explained 30% of variance. Exhaustion failed to become an independent factor; instead, its variance was divided between the other two factors, and either accompanied *Effort* or contrasted the *Meaning*. The factor of effort was weakly correlated with only extrinsic motivation and amotivation (table A2), so it did not seem to be valuable in the context of the present study.

Table A2

Correlations between AMS-rus and factors of burnout (R Пирсона, N = 373)

AMS-rus	Meaningfulness of learning	Effort experience
Learning	0.701**	0.033
Achievement	0.643**	-0.077
Self-development	0.694**	0.030
Self-respect	0.365**	0.266**
Introjected	-0.077	0.323**
External	-0.442**	0.282**
Amotivation	-0.772**	0.155**

Note. ** p<0.001 (2-sided)

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Получена 19.04.2022
Принята в печать 26.08.2022

Received 19.04.2022
Accepted 26.08.2022

Психологическая наука и образование
2022. Т. 27. № 5. С. 34—45
DOI: https://doi.org/10.17759/pse.2022270503
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 34—45
DOI: https://doi.org/10.17759/pse.2022270503
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Health Protection in the Education of Students with Disabilities: Principles and Organization

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The paper presents results of the analysis of empirical research of health-protecting environment in 40 Russian educational organizations for children with disabilities: special (correctional) schools (N=22), schools with an inclusive model of separate classes for students with disabilities (N=8) and schools with joint education of students with and without disabilities (N=10). Complex multifactor monitoring and analysis of websites of these educational organizations were used as research methods, which allowed us to build a mathematical model of health-protecting environment for each type of educational organization, differing in its structure and content, as well as to establish a hierarchy of such psychological and pedagogical components as “spatial organization”, “learning activity”, “correctional assistance”, “professional activity” to identify the formula of “ideal educational organization” for children with disabilities. The paper provides evidence that the components of health-protecting environment do not exist in isolation from each other, but rather have a common cumulative effect, thanks to which the school management can act effectively and realize the school’s pedagogical potential.

Keywords: health protection, accessible environment, disabilities, students, special educational needs, educational organization, inclusion, health, teaching staff.

For citation: Nurlygayanov I.N., Solovyova T.A., Lazurenko S.B., Golubchikova A.V. Health Protection in the Education of Students with Disabilities: Principles and Organization. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2022. Vol. 27, no. 5, pp. 34—45. DOI: https://doi.org/10.17759/pse.2022270503 (In Russ.).

Здоровьесбережение в образовании обучающихся с ОВЗ: принципы и организация

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В работе изложены результаты анализа эмпирического исследования здоровьесберегающей среды в 40 образовательных организациях Российской Федерации, осуществляющих обучение детей с ОВЗ в разных формах: специальные (коррекционные) школы (N=22), школы с инклюзивной моделью отдельных классов для обучающихся с ОВЗ (N=8) и моделью совместного обучения в классе школьников с ОВЗ и нормативно развивающихся сверстников (N=10). В качестве методов исследования применялись комплексный многофакторный мониторинг и анализ сайтов образовательных организаций, что позволило построить математическую модель здоровьесберегающей среды для каждого типа образовательной организации, отличающейся своей структурой и содержанием, а также установить иерархию таких психолого-педагогических составляющих, как «пространственная организация», «учебная деятельность», «коррекционная помощь», «профессиональная деятельность», определить формулу «идеальной образовательной организации» для детей с ОВЗ. Представлены доказательства того, что компоненты здоровьесберегающей среды существуют не изолированно друг от друга, а имеют общий кумулятивный эффект, благодаря чему руководство школы может управлять и эффективно реализовать свой педагогический потенциал.

Ключевые слова: здоровьесбережение, доступная среда, ограниченные возможности здоровья, обучающиеся, особые образовательные потребности, образовательная организация, инклюзия, здоровье, педагогические кадры.

Для цитаты: *Нурлыгаянов И.Н., Соловьева Т.А., Лазуренко С.Б., Голубчикова А.В.* Здоровьесбережение в образовании обучающихся с ОВЗ: принципы и организация // Психологическая наука и образование. 2022. Том 27. № 5. С. 34—45. DOI: https://doi.org/10.17759/pse.2022270503

Introduction

At present, the problems of health saving are actualized and disclosed in connection with the new stage of reforms in education, health and social policy, as well as global challenges of the time: the increasing number of children with chronic diseases, children with disabilities and handicaps, spread of innovative forms of education and creating special educational conditions for children with disabilities in all educational organizations without exception [1].

The challenges faced by domestic science and educational practice in the development and implementation of health-saving technologies require a reference to the terminological space of this area of educational activity. So far, Russian science lacks a common understanding of the definitions of "health preservation", "health-saving environment". Most authors reveal the problem of health preservation through the characteristics/components or technologies.

Thus, N.K. Smirnov [8] uses a valeological approach to the understanding of the educational environment, including ideas about the culture of health and health-saving conditions at school. L.B. Dykhan [2] describes the structure of a health-saving environment by listing its components: a) organization of the learning and education process; b) communication style of the subjects of the educational process; c) sanitary and hygienic conditions of learning and education, d) students' movement mode; e) medical support and health procedures during the school day; f) food. The most complete description of the characteristics of a health-saving environment is presented in a number of works [9; 10].

If we turn to the data of foreign pedagogy, in general, when describing health saving conditions in schools, attention is paid to the design of accessible space, the availability of equipment, professional staff [13; 14; 15].

Designing a health-saving space allows to make the educational process safe, to reduce fatigue and risks of health disorders, to prevent the emergence of school-related pathology of students with disabilities, including the formation of habits to lead a healthy lifestyle, independently control and manage their health in the future.

Currently, the leadership of the state and the Ministry of Education have taken comprehensive measures of organizational and legal nature regulating the process of education of children with disabilities and the protection of their health at different stages of growth and development [5; 7; 12]. A number of laws and regulations in the field of education, disclose the procedure and rules of admission to the educational organization, define the content and specify the characteristics of the organization of the learning process under the adapted basis educational programs (ABEP) [6; 11]. In addition, a number of documents outline the amount of teaching load and its distribution by the main types of learning activities [6; 11], give a clear characteristic of special learning conditions and equipment for collective and individual use [4], indicate norms and rules of providing an accessible and developing educational environment, as well as standards of accreditation and control of educational activity [3].

Regulatory documents indicate that the health-saving environment of an educational organization must have a combination of factors: availability of special educational and technical means; correspondence of the schedule, class density and academic load to the health status and individual psychological abilities of the child; availability of modern rehabilitation equipment; staffing with modern health-saving technologies for working with children with disabilities.

The existing regulatory framework allows the implementation of health saving ideas in the learning process of schoolchildren. Actual problem is a comprehensive and systematic implementation of these provisions in real conditions, as the main task of school

health care is the prevention of diseases that worsen the condition of a child with disabilities and organization of assistance in eliminating negative social factors. The purpose of the work is to identify the characteristics of the environment of the educational organization for students with disabilities by the criterion of its health-saving function. Its results will provide insight into the practice of implementation of the regulatory framework, the functioning of the health care system, "deficits" and "resources" of health-saving technologies in educational organizations with different models of education for children with disabilities.

Organization of research

Sample. The study was conducted on the basis of 40 educational organizations of the Russian Federation that implement the ABEP for students with disabilities, which were randomly selected. The study analyzed data from three types of educational institutions. The first type is represented by special (correctional) schools (N=22), in which only students with disabilities of different nosologies receive education. The second (N=8) and third (N=10) types of schools provide inclusive education, but differ in the form of implementation. Thus, the second type of schools assumes the presence of classes for students with disabilities in the general school (classes for students with a particular type of disability or the so-called "resource" classes). The third type of schools implements the idea of inclusion through education of a student with a disability in a class with normatively developing peers.

The research methods are the analysis of the data from the website of the educational organization and comprehensive multifactor monitoring. The analysis of the data provided on the website of the educational organization involves taking into account such indicators as the category of students with disabilities and options of the ABEP implemented in the school.

Comprehensive multifactor monitoring covers nine main parameters: 1) architectural conditions, 2) conditions for the educational process, 3) special equipment, 4) special didactic material, 5) remedial courses, 6) extracurricular activities, 7) profile education of specialists, 8) availability of teaching staff, 9) dynamics of learning activities. When interpreting the obtained results, for convenience and better meaningful presentation of the material we combined these parameters into integral.

To process the data, we used the calculation of average values and ranking, factor analysis. The ranking procedure made it possible to identify the degree of expression of different components of a health promoting environment in educational organizations, implementing different models of education. In order to predict and determine the structure of psychological and pedagogical components of health promoting environment of an educational organization, the procedure of factor analysis by the method of principal components with subsequent rotation of the data matrix by varimax-normalized type was used. Data processing was carried out in Statistica 10.0 program for the Windows environment.

Results of the study

The first stage of the study consisted in the factorization of data, which made it possible to determine mathematical (empirical) models of health-saving environment for each type of educational organization (Table 1). It is worth noting that the presented models are characterized by harmony, this is evidenced by the unipolarity of the components that form a factor.

Despite the similarity in the structure of the model of inclusive and special education in schools, the degree of their expression is different, this is evidenced by the share of explanatory variance of each factor, indicated as a percentage, as well as the filling of the factors themselves. For example, the factor

"predictors of professional activity" in schools where inclusion is carried out through the organization of classes for students includes indicators of profile education and the availability of appropriate specialists, and, in schools where inclusion occurs through the integration of individual students — only through the availability of teaching staff. Even this aspect will affect the effective organization of the educational process. The mathematical model of health-saving environment in special (correctional) schools differs significantly from the above mentioned ones, in particular, the "predictor of correctional assistance" is singled out separately.

The second stage of the study consisted in ranking the main parameters of health-saving environment in educational organizations (Table 2), implementing different models of education (special and inclusive). The approach we chose allowed us to define a hierarchy of psychological and pedagogical components of a health promoting environment, distinguished by its uniqueness and peculiarity.

For special (correctional) schools the most significant components of health-saving space are "conditions for implementing the educational process", "profile education of specialists", "availability of teaching staff", and insignificant components are "architectural conditions", "correctional courses", "dynamics of learning activities". For schools implementing inclusive education in classes for students with disabilities, the important components of a health-saving environment are "specialist profile education", "extracurricular activities", "conditions for the educational process", and of minor importance are "special didactic material", "dynamics of learning activities", "architectural condi-

Table 1

Factorial (empirical) structure of the health-preserving environment in educational organizations that implement models of special and inclusive education

Special (correctional schools)	Inclusive education through the creation of classes for students with disabilities	Inclusive education through the integration of students with disabilities into the general education class
Factor 1 — "Predictors of spatial organization" (22.1%) Architectural conditions (0.892)	***Factor 1 — "Predictors of Professional Activity" (33.9%)*** Profile education of specialists (0.917) Availability of pedagogical staff (0.751)	***Factor 1 — "Predictors of spatial organization" (30.8%)*** Conditions for the educational process (0.978) Special equipment (0.802)
Factor 2 — "Predictors of remedial assistance" (20.7%) Correctional courses (0.814)	***Factor 2 — "Predictors of learning activities" (29.7%)*** Correctional courses (0.910) Extracurricular activities (0.880) Dynamics of learning activities (0.818)	***Factor 2 — "Predictors of learning activities" (32.2%)*** Correctional courses (0.909) Extracurricular activities (0.949) Dynamics of learning activities (0.937)
Factor 3 — "Predictors of learning activities" (23.0%) Extracurricular activities (0.701) Special equipment (0.806) Dynamics of learning activities (0.898)	***Factor 3 — "Predictors of spatial organization" (19.2%)*** Architectural conditions (0,831) Conditions for the educational process (0.846) Special equipment (0.758)	***Factor 3 — "Predictors of professional activity" (25.2%)*** Availability of pedagogical staff (0.785)

tions". The dominant components of a health promoting environment for schools that implement the model of inclusion through integration of students with disabilities are "conditions for the educational process", "architectural conditions", "remedial courses", and the insignificant components are "extracurricular activities", "dynamics of learning activities", "special didactic material".

The results illustrate that the indicators (components) of a health promoting environment in a comparative context in different conditions of implementation of education for students with disabilities, have both general and specific features. The existing differences are due to a number of reasons: the specificity and traditions of domestic special education, the lack of methodological base of inclusive education system, the disproportion between the regulatory and legal support and its actual implementation in practice, the lack of qualified personnel, etc. Mathematical analysis has revealed both positive indicators and "deficits" in the existing architecture of health-saving environment in educational organizations, implementing different models of education. It should be emphasized that the indicators of health-saving environment do not exist in isolation from each other, but have an overall cumulative effect, allowing schools as a whole to effectively realize their educational potential.

Discussion of the Results of the Study

Qualitative description of the results of the factor analysis procedure allows us to reveal the essence and extrapolate hypothetical models of health preservation organization, built with the help of mathematical processing. Let's begin the presentation with the factors, equally represented in the structure of correlation shoulders of indicators of health-saving environment in different organizations. The factor "predictors of spatial organization" is one of the most important in the design of health-saving environment in connection with the existing regulatory and legal requirements, human-

Table 2

Ranking of indicators of a health-saving environment in educational organizations that implement models of special and inclusive education

Indicators	Special (correctional schools)		Inclusive education through the creation of classes for students with disabilities		Inclusive education through the integration of students with disabilities into the general education class	
	Mean	Grade	Mean	Grade	Mean	Grade
Architectural conditions	2.20	7	2.00	9	2.43	2
Conditions for the educational process	2.65	1	2.43	3	2.49	1
Special equipment	2.45	4	2.57	4	2.19	6
Special didactic materials	2.30	5	2.14	7	1.86	9
Correctional courses	2.25	8	2.29	5	2.33	3
Extracurricular activities	2.35	6	2.57	2	2.14	7
Special education of specialists	2.55	2	2.71	1	2.29	4
Presence of pedagogical staff	2.50	3	2.21	6	2.24	5
Dynamics of educational activity	2.15	9	2.07	8	2.00	8

ization of the educational process, including the perception of a student with disabilities not as an "object of educational impact", but as an equal "subject" with its individual and psychological characteristics and educational needs. The presence of the factor "predictors of learning activity" emphasizes that the main purpose of the school is to implement educational functions, first of all, training and education, socialization of a child with disabilities. If in schools implementing the inclusive model of education the learning activity covers also the remedial component, then for special (remedial) schools' differentiation of implementation of learning activity and remedial component is characteristic. Therefore, only for this type of schools the mathematical modeling procedure singled out the factor "predictors of remedial assistance", as learning activity should also carry a corrective orientation. A separate factor "predictors of professional activity" was identified for schools working on the inclusive model. At the same time, for schools implementing exclusively the ABEP, due to the established system in the work with the staff, as well as traditions in the field of education for defectologists, the staffing problem is not so relevant and this factor was not highlighted.

Analysis of the integral parameters of the health promoting environment in educational institutions revealed the potential and limitations of each of them. Thus, the factor of the educational environment, which includes architectural conditions, including compliance of premises, classrooms and classrooms with the norms of SanPiN, the requirements of the program "Accessible Environment" and the special educational needs of children with disabilities, took the first ranking and was the most favorable relative to other components. This is due to the fact that most educational organizations are located in new buildings with high functionality and modern ergonomics. Educational organizations with low values of this component are located in old buildings. In this regard, it is impossible to reconstruct them, equip the building with elevators, expand recreational facilities and provide space for gyms. Most often these are separate educational organizations for children of a particular psychological and pedagogical category, implementing training in the ABEP. Low values of this factor occurred when students with disabilities of different nosologies were taught in the same educational organization. In this case, the conditions were not fully created for the education of children with sensory or motor impairments, in accordance with the conditions for the education of children with mental retardation and/or autism spectrum disorders.

Inconsistency of the spatial environment (rooms and classrooms with requirements for accessibility and adaptability) can have a negative impact on the organization of the educational process. Failure to implement the principles of health preservation ultimately has a complex effect on the health of the schoolchildren, their academic performance and psychological state. Regardless of the form of organization of education, a low level of the indicator "dynamics of learning activity" was noted with fairly stable indicators of the state of health of children with special educational needs. This pattern indicates limited use of health-saving technologies in the learning process, low scientific validity and lack of educational technologies for a number of nosological categories. Low effectiveness of traditional methods and technologies of health promotion, as well as their incorrect use in the construction of lessons leads to overwork, decreased interest and cognitive activity of students with disabilities, unwillingness to interact with the teacher and classmates, negativism manifestations. It is known that the choice of teaching method, as well as health saving technology, should be based on the type of disability, the actual psychophysical state of the child, and it itself should be adapted

to the special educational needs of the student, which would make it available for independent use by the child. The corrective and restorative potential of technology is reduced or has no effect if the above factors are ignored. In schools that implement the model of inclusion, the implementation of health-saving technologies for children with disabilities is extremely difficult, due to significant differences in the organization and mode of their implementation, the existing time constraints in lesson planning for students of the whole class.

Even lower values were obtained for the factor of provision with special equipment and didactic materials. Problems with the use of special didactic materials are related to insufficient updating, most often due to the lack of such materials or their high price. The availability of equipment and educational and methodological support for the educational process in the absence of qualified personnel will not allow for optimal pedagogical work. On the other hand, the lack of rehabilitative, developmental and educational equipment has a negative impact on the health and academic performance of students, especially in schools that are older and have not undergone complete modernization. In special (correctional) schools this problem is expressed to a less extent due to the long experience of implementing this model of education, orientation on the documents and achievements of domestic defectological science, availability of qualified teaching staff, and consequently knowledge of the basic needs of children with disabilities. In schools that implement the inclusion model, this issue is often more acute. The reason is as follows: a diverse contingent of students, the staff lacks staff with the necessary professional qualifications, which does not always allow to fully consider the latest trends in the theory and practice of defectology, build an individual approach to the educational needs and abilities of each child, implement promising methodological developments in the process of training and education of children with disabilities.

Significant problems have been identified in the organization of extracurricular activities and the remedial component in the structure of the educational process. The implementation of remedial courses is often hampered by a shortage of subject specialists, insufficient funding to expand the content of the courses. That is why organizations implementing inclusive education often offer only courses in speech therapy and remedial and developmental classes with a speech pathologist. In special schools, the system of remedial work is fully built up and put into practice. However, it should be noted that the courses are not always offered that meet the needs of students, both in terms of psycho-physiological features and in terms of further social adaptation and socialization. The availability of professional staff in educational organizations with competencies in the field of correctional and developmental and rehabilitation work also has a great influence. It is worth noting the problem of organizing extracurricular activities, typical for schools, where education is implemented in the form of integration of individual students with disabilities into the classroom with healthy peers. Often in this case, education is implemented in the home form and its basis are subject areas, and extracurricular activities are implemented formally, or are absent from the curriculum. In this situation, students with disabilities do not always have the opportunity to integrate into those forms of extracurricular activities that are implemented by the educational organization. In a special (correctional) school the organization of extracurricular activities is traditionally given considerable attention. Unfortunately, a separate problem is the discrepancy between the offered extracurricular activities (circles, courses) and psycho-physiological features and needs, health status of students, which, of course, does not contribute to the harmonious develop-

ment of students and can cause difficulties in social adaptation.

Illustrating the main factors that determine the health-preserving environment of an educational organization, it is necessary to dwell on the staff. This problem is quite relevant for a number of reasons: the Federal State Educational Standard (FSES) assumes the presence of specialists with specialized education and relevant qualifications, with competencies relevant to modern demands of society; temporary shortages and the heavy nature of activity can lead to professional deformations and outflow of personnel from the field of education. There is an urgent need to improve the qualifications of staff, since specialists are usually trained to work with only one category of students. The low qualification of staff is exacerbated by the shortage of specialists in all profiles: oligofrenopedagogy specialists, visual impairment specialists, teachers of the deaf, special psychologists, speech therapists. We should also note the low percentage of young personnel in the educational process, which does not allow the full transfer of professional experience.

Main Results

Thus, our monitoring allowed us to identify the state of psychological and pedagogical components of a health promoting environment in educational organizations that educate children with disabilities. The data collected with its help became the basis for the formulation of a number of conclusions and recommendations to improve the education system for children with disabilities:

1. Currently, due to the implementation of state programs, in educational organizations for children with disabilities, which are located in modern classrooms, a modern health-saving environment is created: the premises and classrooms, gyms, spaces for extracurricular activities and vocational training meet the regulatory requirements.

2. In all educational organizations that implement various models of education for children with disabilities, mechanisms of interdisciplinary interaction have not been built and forms of network partnership with health care institutions are insufficiently implemented, which leads to incomplete or limited information about the health of students and teaching errors in determining the conditions, forms and mode of education and, consequently, deterioration of the psychological state of students, their academic performance and health indicators.

3. A separate problem of educational organizations is the lack of information about the current state of health of children with disabilities, which does not allow to properly build lesson and extracurricular activities, remedial work. This problem is most acutely felt in educational institutions implementing the inclusive model.

4. Asynchrony and disproportion in the implementation of lesson activities, on the one hand, and extracurricular activities and remedial courses, on the other, are characteristic of all models of education for children with disabilities. If lesson activities are largely regulated by the existing FSES, the content of extracurricular and remedial work is determined by the capabilities of the organization (availability of specialists, students with different nosologies, lack of equipment and facilities).

5. The diversity of psychological and pedagogical groups of students, shortage of qualified personnel, lack of coordination with special (remedial) schools indicates the need for schools implementing the model of inclusion to algorithmize and prescribe in the relevant regulations, the necessary special equipment and educational and methodological support of the educational process for specific groups of students. Regulation of education of children with disabilities in inclusive practice will be an effective way to implement all the necessary conditions, taking into account the requirements of FSES and the special needs of students with disabilities.

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Получена 24.06.2022
Принята в печать 30.08.2022

Received 24.06.2022
Accepted 30.08.2022

Психологическая наука и образование
2022. Т. 27. № 5. С. 46—56
DOI: https://doi.org/10.17759/pse.2022270504
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 46—56
DOI: https://doi.org/10.17759/pse.2022270504
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Academic Achievement of Students in Schools with High Numbers of Migrant Children

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The article presents the results of studying the relationship between the academic achievements of students and the number of migrant children studying with them. The presented review of studies conducted on various ethno-cultural and national samples shows the ambiguity of this relationship. The authors analyzed statistical data on the ratio of children of foreign citizens in the region, as well as on the number of educational organizations with different ratios of children of foreign citizens in relation to schoolchildren with Russian citizenship. These indicators were compared with the assessment of the quality of education, for which the overall indicator of the education quality in the Russian regions presented by Rosobrnadzor was used, as well as with the index of the socio-economic situation in the regions. Analysis of data from the 85 regions of the Russian Federation showed that the ratio of migrant students (foreign citizens) in Russia to students with Russian citizenship in general education institutions is not related to the quality of education in the region considering its socio-economic situation. Basing on the results of discussion and comparison with the data of the world-wide research, we conclude that the concentration of migrant children in an educational institution should not act as a significant marker of educational policy in this area.

Keywords: migrant children, academic achievements, resilience, academic success, socio-economic status.

Funding. The study was carried out as part of the implementation of the state grant of the Moscow State University of Psychology & Education for 2022 “Scientific and methodological development and testing of a system for identifying the special educational needs of foreign minors and the necessary psychological and pedagogical support of their learning processes, social and cultural adaptation”.

For citation: Khukhlaev O.E., Chibisova M.Y. Academic Achievement of Students in Schools with High Numbers of Migrant Children. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education,* 2022. Vol. 27, no. 5, pp. 46—56. DOI: https://doi.org/10.17759/pse.2022270504 (In Russ.).

Образовательные достижения учащихся в школах с высокой численностью детей-мигрантов

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Представлены результаты изучения связи образовательных достижений учащихся и численности детей-мигрантов, обучающихся совместно с ними. Представленный обзор исследований, проведенных на различных этнокультурных и национальных выборках, показывает неоднозначность данной связи. Авторы проанализировали статистические данные о соотношении детей иностранных граждан в регионе, а также о численности общеобразовательных организаций с различным соотношением детей иностранных граждан по отношению к школьникам, имеющим российское гражданство. Выделенные показатели были соотнесены с оценкой качества образования, для чего был использован сводный показатель оценки регионов России по качеству образования, представленный Рособрнадзором, а также с индексом социально-экономического положения регионов. Анализ данных по 85 регионам Российской Федерации показал, что соотношение количества обучающихся мигрантов (иностранных граждан) в России и обучающихся, имеющих российское гражданство, в общеобразовательных организациях не связано с качеством образования в регионе при учете социально-экономического положения региона. По результатам обсуждения и соотнесения с данными мировых исследований делается вывод о том, что концентрация детей-мигрантов в образовательном учреждении не должна выступать в качестве значимого маркера образовательной политики в данной области.

Ключевые слова: дети-мигранты, образовательные достижения, резильентность, академическая успешность, социально-экономический статус.

Финансирование. Исследование выполнено в рамках реализации государственного задания ФГБОУ ВО МГППУ на 2022 г. «Научно-методическая разработка и апробация системы выявления особых образовательных потребностей несовершеннолетних иностранных граждан и необходимого психолого-педагогического сопровождения процессов их обучения, социальной и культурной адаптации».

Для цитаты: *Хухлаев О.Е., Чибисова М.Ю.* Образовательные достижения учащихся в школах с высокой численностью детей-мигрантов // Психологическая наука и образование. 2022. Том 27. № 5. С. 46—56. DOI: https://doi.org/10.17759/pse.2022270504

Introduction

The study of the factors influencing educational achievements of students is invariably of interest to both researchers and practitioners. It has been shown that educational outcomes can be determined by the characteristics of students themselves, both psychological (motivation, resilience, etc.) and socio-demographic (access to early education, etc.), their interaction with reference persons [12; 18]. A fairly large array of data has also been accumulated, showing that the socio-economic characteristics of school and the region of residence can be considered as determinants of educational achievements [3]. Increasing importance of problems of psychological and pedagogical support for students-children of foreign citizens stimulates attention to the number of migrant children in an educational organization as a factor influencing the educational results of students. In this article, we will focus on the educational achievements of host culture students attending educational institutions with a high number of migrant children.

The results of similar studies conducted on various ethnocultural and national samples are ambiguous.

In a number of studies, no relationship was found between the concentration of migrant children and students' educational achievements. According to the report of the UK education system, there is no relationship between the proportion of students with English as a second language (EAL) among students in the region and the overall level of student achievement [15]. A Norwegian study [11] found that the ethnic composition of school does not affect educational achievements of schoolchildren belonging to the ethnic majority and second-generation migrants.

Research also shows evidence that the concentration of migrant children is positively associated with the academic achievement of the host population.

In France [8], it was found that the concentration of foreigners in school increases the likelihood of them being on the academic track in upper secondary school. This demonstrates the positive impact of the concentration of migrants in school on second-generation migrant students.

A large-scale study of the impact of an increase in the number of migrant children in schools on academic success was conducted in Spain in 2003—2009 using PISA data [19]. The influence of migrant children concentration in schools on changes in indicators of the quality of education, including the number of children remaining in school, was studied. The results showed that an increase in the number of migrant children does not result in growing number of students who repeat an academic year; on the contrary, this number is slightly reduced.

A Norwegian study [14] examined the impact of the concentration of migrant children in schools on the completion of secondary education (which is not compulsory in Norway). Controlling for the influence of educational organization type, family characteristics, etc., the researchers found that students in cohorts with a large number of migrant peers in the same school show a higher probability of completing education.

At the same time, some studies conclude that the academic success of schoolchildren is negatively associated with an increase in the number of migrant children learning together with them.

In the Netherlands, a study of primary school students was conducted, focusing on the effect of the migrant children concentration in the classroom on the academic achievements of host society children [9]. The authors found that while the number of migrant classmates who have been in the Netherlands for several years has no effect on the achievement of local students, there is a negative effect of class concentration on migrant children who have been in the

country for a short period. The effect size, however, is small and only statistically significant for the Dutch language skill.

In Spain [10], it has been shown that the concentration of non-Hispanic migrant students (i.e., those whose mother tongue is not Spanish) in schools is negatively associated with student test scores in mathematics, but this effect is not significant. The authors of the study explain these results by the assumption that migrant children are more likely to study together with students from socially disadvantaged groups, and therefore the reason for the worse results of schoolchildren who study with migrants is their socio-economic status.

The assumption that the socio-economic status is the primary factor, and the "migrant" or "foreign language" background of students acts as a so-called "false correlation" corresponds to the data obtained by the Programme for International Student Assessment (PISA) [13].

According to PISA results in OECD countries, 15-year-old students attending schools with a high concentration of migrants tend to perform worse in school than students attending schools with no migrant students. But this difference reflects the fact that many migrant students are at a socio-economic disadvantage. The average OECD difference in Math performance between students attending schools with a high proportion of migrants compared to students attending schools without such students is 18 points, equivalent to about six months of schooling. But after taking into account the socio-economic situation of students and schools, the difference decreased to 5 points. Socio-economic differences aside, in 14 out of 35 comparable countries/economies, students in schools with high concentrations of migrant students underperform in Mathematics.

However, after accounting for these differences, the number of countries/economies where these students underperform drops to seven. Moreover, in most of them, the differences in performance are so small that they are actually negligible. Thus, the PISA data show that it is not the concentration of immigrant students at school, but rather the concentration of socio-economic disadvantages in the school that hinders student achievement.

Although the PISA data are highly reliable, their limitation can be attributed to the fact they are based on a cross-sectional analysis of only 15-year-old. Whether these conclusions can be extended to all levels of education is a debatable question. Also, accommodating national and cultural specifics in PISA data can be reflected in the results of individual countries. Thus, the hypothesis about the prevalence of socio-economic unfavorable conditions over migration experience requires additional confirmation on the Russian sample. The presence of contradictions in the results of international studies also indicates the relevance of raising this issue.

In Russia, studies of the problem of the influence of the number of migrant students on educational achievements have not been previously conducted. The only known data are presented in a representative study of schools in St. Petersburg [7], which examined the influence of gender, ethnicity, and migration status on the educational success and plans of students in grades 8—10. It was found that schoolchildren with migration experience study better than St. Petersburg children, while the first generation gets a greater advantage than the second (an increase in grades by 0.059 and 0.044 times, respectively).

Our study was aimed at testing the hypothesis that the number of migrant students does not affect the quality of education of host society students, but socio-economic characteristics are significant for this.

Sample and Research Methods

As a marker of the number of migrant children, data from the federal statistical ob-

servation form of the Ministry of Education of the Russian Federation were used [6]. We used the data on how many children were studying in comprehensive educational institutions of each region of the Russian Federation as of September 20, 2021 and how many of them have foreign citizenship. Based on this, for each region of the Russian Federation, the ratio of students-children of foreign citizens in the region was calculated.

To determine the ratio of the number of foreign citizens and citizens of the Russian Federation, learning together, we also used the data of the results of the monitoring, carried out by the Ministry of Education of Russia in the fourth quarter of 2021, presented in the Analytical Report of the Federal State Budgetary Educational Institution of Higher Education MSUPE "Approaches to establishing the ratio of the number of foreign citizens and citizens of the Russian Federation, optimal for social, language and cultural adaptation of foreign students" [1]. In this report, for each region of the Russian Federation, the quantity of comprehensive education institutions with the following ratio of students-foreign citizens to students with Russian citizenship is presented: less than 1%; from 1 to 3%; from 3—10%; from 10—20%; from 20—50%; over 50%. For each ratio, the analysis included the population for each of the 85 regions of the Russian Federation, with the exception of ratio of less than 1%: due to filling errors, these data are valid only for 35 regions.

The criterion for assessing the quality of education was the data on the assessment of the regions of Russia in terms of the quality of education, presented by Federal Education and Science Supervision Service [4]. We used the data from four indicators related to the "Learning Outcomes" dimension: 1) achievement of the minimum level of training; 2) achieving a high level of training; 3) educational equity; and 4) functional literacy. For the purposes of the study, an integral assessment of the quality of education in the field of learning outcomes in school (arithmetic mean) was calculated. The final indicator reflects the assessment of the region in the field of learning outcomes at school according to Federal Education and Science Supervision Service.

As a control variable, we used the "Rating of the socio-economic situation of the regions for 2020", compiled by the experts of the agency "RIA rating" according to the Ministry of Finance of Russia, the Federal Treasury and Federal Service of State Statistics [5]. The methodology is based on the aggregation of various indicators characterizing socio-economic situation of the regions. The need to consider socio-economic situation of the regions was explained by our hypothesis and is related to the fact that this indicator is closely related to the quality of the education system and should be accounted for when calculating the impact of children of foreign citizens ratio.

Using the data described above, we analyzed the relationship between the ratio of students of foreign citizens in the region, the number of comprehensive education institutions with a different ratio of students of foreign citizens in the region, and the assessment of the quality of education in the field of learning outcomes at school. When constructing the regression model, we used numerical data (integral rating) from the "Rating of the socio-economic situation of regions for 2020" as a control variable.

Research Results

In accordance with the data of the Ministry of Education of the Russian Federation [6], at the beginning of the 2021/22 academic year, a total of 17,317,521 schoolchildren studied in comprehensive educational organizations in the country, of which 124,057 have foreign citizenship (of which 4,047 have two or more citizenships), stateless students — 2,277 people. Consequently, the overall ratio of the quantity of foreign citizens and citizens of the Russian Federation learning together is 0.7%.

To identify the relationship between the studied variables, statistical analysis was carried out with the calculation of the Pearson correlation coefficient (the results are presented in Table 1). According to the data, there is a weak positive relationship between the ratio of foreign children studying in the region and the region's assessment of the quality of education, which reflects the results of schooling.

The number of educational institutions with the following ratio of the quantity of foreign students studying in the region 1—3%, 3—10% and 10—20% also demonstrates a positive relationship with the quality of education in the region.

A correlation similar to the ratio of children of foreign citizens in terms of strength and reliability is observed between the scores of the Rating of the Socio-Economic Situation of the Regions and the assessment of the region in terms of the quality of education.

Thus, regions in which foreign students are more represented, where educational organizations with a ratio of foreign students from 1% to 20% are more represented, according to Federal Education and Science Supervision Service, demonstrate higher learning outcomes in school.

It should be noted that, both with the assessment of the regions in terms of the quality of education by Federal Education

Table 1

Correlations between the socio-economic situation of the regions, ratio of children of foreign citizens, number of educational institutions (EIs) with a different ratio of children of foreign citizens and the assessment of the quality of education in the region

	Evaluation of the region in terms of the quality of education: learning outcomes at school	**Rating of the socio-economic situation of the regions**
Rating of the socio-economic situation of the regions	0.367**	1
The ratio of children of foreign citizens in the region	0.324**	0.535**
The total number of educational institutions with the ratio of the number of foreign students studying 1—3%	0.281*	0.603**
The total number of educational institutions with the ratio of the number of foreign students studying 3—10%	0.336**	0.447**
The total number of educational institutions with the ratio of the number of foreign students studying 10—20%	0.292**	0.423**
The total number of educational institutions with the ratio of the number of foreign students studying 20—50%	0.050	0.269*
The total number of educational institutions with the ratio of the number of foreign students studying more than 50%	-0.251	-0.001

Note. *$p \leq 0.05$; **$p \leq 0.01$.

and Science Supervision Service, and with the ratio of foreign students studying in educational institutions, indicators of socio-economic development of the region are also significantly related. The higher this indicator, the higher the results in the field of learning outcomes at school that are shown by the region according to Federal Education and Science Supervision Service, and the more foreign students are represented in it.

To test the relationship of these variables, we used multivariate regression analysis, where the dependent variable was the assessment of the regions in terms of the quality of education by Federal Education and Science Supervision Service.

The independent variables were:

a) the ratio of the number of foreign students studying in educational institutions with a total number of students in the region;

b) socio-economic development of the region index.

Data on the number of educational institutions with different ratios of the number of foreign students in the region were not used in the regression analysis to prevent multicollinearity.

Initially, the ratio of the number of foreign students studying in educational institutions to the total number of students in the region was introduced into the regression model as predictors.

The model was found to be significant ($p \leq 0.01$). The ratio of the number of foreign citizens studying in comprehensive educational institutions to the total number of students in the region acted as a predictor of the quality of education in the region ($p \leq 0.01$).

At the second step, the socio-economic development of the region index was introduced into the model. The volume of the explained variance of the model increased more, its significance also increased ($p \leq 0.001$), and the relationship between the ratio of foreign students studying and the assessment of the quality of education disappeared.

As a result, the predictor of the assessment of the region in terms of the quality of education in the regions of the Russian Federation in terms of the quality of education of Federal Education and Science Supervision Service (in terms of learning outcomes at school) was the index of socio-economic development of the region.

Table 2

The ratio of children of foreign citizens and socio-economic development of the region as predictors of the assessment of the region in terms of the quality of education (outcomes of schooling)

		β
Step 1.		
The ratio of the number of foreign citizens studying in comprehensive educational institutions to the total number of students in the region.		0.32 **
R^2	0.10	
F	9.60**	
Step 2.		
The ratio of the number of foreign citizens studying in general educational institutions to the total number of students in the region.		0.18
Index of socio-economic development of the region.		0.27*
R^2	0.16	
ΔR^2	0.06	
F	7.58***	

Note. *p≤0.05; **p≤0.01; ***p≤0.001.

Discussion of the Results

In general, the results show the existence of a relationship between the ratio of migrant students and the quality of education, and the relationship is positive. This relationship is also reflected in the number of educational institutions in the region with the ratio of children of foreign citizens from 3 to 50%. The absence of this connection for schools where there are more than 20% of migrant children is most likely due to their small number in most regions.

As statistical analysis shows, the reason for the direct relationship between the number of migrants and the quality of education is not the influence of migrant children, but the desire of their parents for economic well-being and the logic of migration planning. Parents of migrant children obviously plan to migrate mainly to the most economically developed subjects of the Russian Federation. The same regions predictably demonstrate a higher assessment of the quality of school education. Moreover, the presence of migrant children does not have any effect on the results of the region in the field of schooling.

Our results are consistent with PISA data showing that it is the concentration of socioeconomic disadvantages in schools that hinders student achievement, and the concentration of immigrant students in schools is not important as such.

We can say that the negative factor is the concentration of socio-economic inequality in the local educational environment, and not the concentration of migrants. Studies show that, compared with their host culture peers, migrant students are more likely to attend urban schools and schools with higher concentrations of students with low socioeconomic status and higher student-teacher ratios [19].

This is consistent with local studies of individual countries. For example, in Portugal it was found [20] that the influence of school social composition is more important for student achievement than the influence of school ethnic composition, and that students from Portuguese-speaking African countries benefit more than other students in terms of academic performance when they attend schools with higher socioeconomic level of students. In the Netherlands, it has been shown that the concentration of migrant classmates with a low level of parental education negatively affects the performance of local residents in host country language, while no such effect was found for migrant children with a high level of parental education [9].

Boado [8] makes an important methodological adjustment to this issue. If it is assumed that the distribution of migrant schoolchildren across social spaces is a random process, then the results confirm the negative impact of their concentration on academic performance. If, on the contrary, the result of mechanisms for sorting students into school districts are considered, then available evidence suggests that the concentration of migrant children does not have statistically significant effect on the performance of classmates.

Analyzing the issues of resettlement of migrants in Russia, sociologists note that "if skilled migrants, considered by society as potential citizens, with rare exceptions, are settled evenly throughout the city, in accordance with ethnic quotas for houses and districts, temporary migrants mostly live separately — in old districts, and also in special migrant hostels placed on the urban periphery" [2, p. 499].

Thus, the territorial segregation of migrant families inevitably ensures their unequal sorting by educational institutions. Moreover, a child from a migrant family is more likely to attend a school with poor educational outcomes.

Conclusions

The ratio of the number of migrants (foreign citizens) studying in Russia to

students with the Russian citizenship in comprehensive education institutions is not related to the quality of education in the region, considering the socioeconomic situation in the region.

This result corresponds to the main trends of international studies and allows us to state that the number of migrant students in an educational institution cannot be considered as a factor of educational achievements of host society students; whereas social and economic situation of the family should be considered as such a factor.

It is also important to take into account that the concentration of migrant children in schools is the result of a concentration of adverse conditions, i.e., the result, not the cause, of underperformance.

Thus, we can conclude that the concentration of migrant children in an educational institution should not act as a significant marker of educational policy in this area.

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Получена 01.06.2022
Принята в печать 26.08.2022

Received 01.06.2022
Accepted 26.08.2022

Психологическая наука и образование
2022. Т. 27. № 5. С. 57—68
DOI: https://doi.org/10.17759/pse.2022270505
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 57—68
DOI: https://doi.org/10.17759/pse.2022270505
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Perfectionism and Academic Adjustment among Undergraduates: the Coping Strategy as a Mediator

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The high dropout rate among undergraduates has drawn the concerns of policymakers and educators. Studies suggested that the dropout is relevant to poor academic adjustment, and to poor academic adjustment is associated with perfectionism and coping strategies. This study adopts the personality-coping-outcome theory as a framework to examine whether coping strategies mediate the effects of perfectionism on academic adjustment. Two hundred eleven undergraduate students participated in the online survey through the purposive sampling method. They were asked to fill in the Short-Almost perfect scale, simplified coping style questionnaire and academic adjustment scale. The results showed that both perfectionism and coping strategies are associated with academic adjustment, and perfectionism is associated with coping strategies. Besides, coping strategies are statistical mediators for the effects of perfectionism on academic adjustment. The findings support the application of personality-coping-outcome theory in the areas of academic adjustment. Workshops can be provided to students to train their use of appropriate coping strategies while facing academic adjustment issues.

Keywords: problem-focused coping, emotional-focused coping, adaptive perfectionism; maladaptive perfectionism, Malaysia.

For citation: Siah P.C., Ang S.S., Tan K.W., Phi C.N., Pung P.W. Perfectionism and Academic Adjustment among Undergraduates: the Coping Strategy as a Mediator. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2022. Vol. 27, no. 5, pp. 57—68. DOI: https://doi.org/10.17759/pse.2022270505 (In Russ.).

Перфекционизм и академическая адаптация среди студентов: копинг-стратегии как посредник

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Высокий уровень отчисления студентов вызывает озабоченность у законодателей и преподавателей. Исследования показали, что отчисление связано с низкой академической адаптацией, которая, в свою очередь, связана с перфекционизмом и копинг-стратегиями. В этом исследовании используется теория личностно-ориентированного копинга в качестве основы для изучения того, могут ли копинг-стратегии служить посредником между перфекционизмом и его влиянием на академическую адаптацию. Двести одиннадцать студентов бакалавриата приняли участие в онлайн-опросе методом целенаправленной выборки. Им было предложено заполнить «Почти совершенную шкалу», упрощенный опросник стиля копинга и шкалу академической адаптации. Результаты показали, что и перфекционизм, и копинг-стратегии связаны с академической адаптацией, а перфекционизм связан с копинг-стратегиями. Кроме того, копинг-стратегии выступили значимыми посредниками влияния перфекционизма на академическую адаптацию. Полученные данные подтверждают применение теории личностно-ориентированного копинга в области академической адаптации. Для студентов, которые сталкиваются с проблемами академической адаптации, могут быть организованы семинары, чтобы научить их использовать соответствующие копинг-стратегии.

Ключевые слова: проблемно-ориентированный копинг, эмоционально-ориентированный копинг, адаптивный перфекционизм, неадаптивный перфекционизм, Малайзия.

Для цитаты: *Сиах П.Ч., Анг С.С., Тан К.В., Пхи Ч.Н., Пунг П.В.* Перфекционизм и академическая адаптация среди студентов: копинг-стратегии как посредник // Психологическая наука и образовани. 2022. Том 27, №. 5, С. 57—68. DOI: https://doi.org/10.17759/pse.2022270505

Introduction

Academic Adjustment

In Malaysia, more than 44 per cent of secondary students are able to enrol in tertiary education in 2016 [44]. However, it is estimated that about 21 per cent of them are not able to graduate and thus drop out from the universities [24]. According to Baker [4], poor academic adjustment is a factor that is relevant to the university dropout. Academic adjustment is defined as the degree of students adapting themselves to the education requirements, including their drives to goals, efforts, and contentment towards the academic environment [2]. The poor academic adjustment may occur because university life is highly distinct from their previous school experiences. Many undergraduates have to face the differences in academic demands, learning processes, and autonomy on time and activity [12]. Therefore, these students who have academic adjustment problems may experience poor academic performance [3; 5].

Some studies have supported the associations between academic adjustment and academic performance. For example, Aspelmeier et al. [3] surveyed 322 US undergraduate students and they found that academic adjustment is positively associated with students' academic grade. Besides the associations between academic adjustment and academic performance, some studies revealed the associations between academic adjustment and psychological well-being. For example, Clinciu [7] surveyed 157 undergraduate students in Romania. They found that participants who are better in academic adjustments have lower perceived academic stress.

Due to the associations between academic adjustment and academic performance and between academic adjustment and psychological well-being, Van Rooij et al. [37] suggested that it is essential to explore academic adjustment among students who underwent the transition from secondary school to the freshman year in the university.

Perfectionism

Some studies reported that personalities could be relevant to academic adjustment. For example, Sripan and Sujivorakul [34] surveyed 277 vocational learners from three vocational schools in Bangkok of Thailand. They found that self-determination is a significant predictor of intention to persist in the study.

Perfectionism is another personality trait that associates with academic adjustment. Perfectionism refers to a personality trait associated with attempting to have no error with the belief that others have high expectancy and a critical assessment of oneself [35]. Perfectionism is multidimensional, and it is characterized by high self-performance expectations and critical self-evaluations [13].

People with adaptive perfectionism are organized to meet personal standards but are less concerned about their capability to meet those standards [27]. Therefore, they are less anxious about making mistakes and tend to take action to solve their problems [10]. In contrast, maladaptive perfectionists are less organized but are more concerned about mistakes [27]. More specifically, they fear failure, so they tend to do nothing [22]. Some researchers reported that maladaptive perfectionism could result in academic procrastination [8]. Therefore, adaptive or maladaptive perfectionism may lead to a different academic adjustment level due to their ways of handling their academics.

Perfectionism and Academic Adjustment

Some studies have found an association between perfectionism and academic adjustment. For example, Lapoint and Soysa [20] recruited 175 US undergraduate students. They found that adaptive perfectionism was positively associated with academic adjustment, whereas maladaptive perfectionism was negatively associated with academic adjustment.

Coping and Academic Adjustment

Besides personality, coping strategies can be another factor relevant to academic adjustment. Coping is a dynamic, behavioural, and cognitive effort that people implement to encounter internal or external stress [26]. Some researchers categorize coping strategies into problem-focused coping and emotion-focused coping. Problem-focused coping refers to directly dealing with the problem, while emotion-focused coping is characterized more by managing negative emotions [36].

Some studies have been conducted to examine the relationships between coping and academic adjustment. For example, Bukhari and Ejaz [6] surveyed 300 Pakistani students, and they found that problem-focused coping was positively associated with academic adjustment. Iruloh and Ukaegbu [18] surveyed 382 undergraduate students in Nigeria. Their results also showed that problem-focused coping strategies significantly contributed to academic adjustment. However, no significant association was found between emotion-focused coping strategies and academic adjustment.

Perfectionism and Coping Styles

Since perfectionism and coping styles are associated with academic adjustment, it indicates a possible relationship between perfectionism and coping styles. For example, Zhang and Zhao [41] surveyed 350 China undergraduate students. The results concluded that adaptive perfectionism is positively correlated with mature coping styles, such as problem-solving, but is negatively correlated with immature coping styles, such as avoidance. In contrast, maladaptive perfectionism is negatively correlated with mature coping but positively correlated with immature coping.

Mediating Effect of Coping Styles

As shown in the above review, studies have shown the associations between personality and coping styles, personality and academic adjustment, and coping styles and academic adjustment. These associations suggested that there is a mechanism that links these three variables together. The personality-coping-outcome theory provides a framework to examine the mechanism. This theory proposes that when one encounters stressful situations, personality influences one's coping style differently, which further affects one's adjustment [14]. In other words, coping strategies can be a mediator for the effects of personality on the outcomes.

Some studies have reported the mediating effect of coping styles for the effects of personality on some psychological outcomes. Siah et al. [32] surveyed 150 Malaysian undergraduate students. Using the personality-coping-outcome theory as a framework, they found that coping strategy is a mediator for the effects of locus of control on procrastination. Locus of control is the tendency to believe that they have control over their life episode throughout their whole life [29]. Zhang and Cai [40] surveyed 412 introductory psychology undergraduates from China. They found that coping strategies mediated the effect of maladaptive perfectionism on depression.

Aims of the Study

In our knowledge, no study has examined whether coping styles mediated the effects of perfectionism on academic adjustment or not. Accordingly, using the personality-coping-outcome theory proposed by Gallagher as a framework [14], this study examines this issue. The hypotheses and conceptual framework of this study are as follows:

Hypotheses

H1. Perfectionism is associated with academic adjustment

H1a: Adaptive perfectionism is positively associated with academic adjustment

H1b: Maladaptive Perfectionism is negatively associated with academic adjustment

H2. Coping styles are associated with academic adjustment

H2a: Problem-focused coping style is positively associated with academic adjustment

H2b: Emotion-focused coping style is negatively associated with academic adjustment

H3. Perfectionism is associated with coping style

H3a: Adaptive perfectionism is positively associated with the problem-focused coping style

H3b. Adaptive perfectionism is negatively associated with the emotion-focused coping style

H3c: Maladaptive Perfectionism is positively associated with the emotion-focused coping style

H3d. Maladaptive perfectionism is negatively associated with the problem-focused coping style

H4. Coping style is a mediator for the effect of perfectionism on academic adjustment

H4a: Problem-focused coping style is a statistical competitive mediator for the effect of adaptive perfectionism on academic adjustment

H4b: Emotion-focused coping style is a statistical complementary mediator for the effect of adaptive perfectionism on academic adjustment

H4c: Problem-focused coping style is a statistical complementary mediator for the effect of maladaptive perfectionism on academic adjustment

H4d: Emotion-focused coping style is a statistical competitive mediator for the effect of maladaptive perfectionism on academic adjustment

Method

Research Design

A cross-sectional survey research design was administered in this quantitative study. A cross-sectional research design is a design that allows data collection of all variables to be carried out among the same participants at one point in time [30] and to discover the determinants of the interesting outcome and the possible relationships among the variables [42].

Participants

A total of 211 participants replied to the online survey. However, the total valid sample was 170 as 41 responses do not meet the study's inclusion criteria, that they should be Malaysian and an undergraduate. The sample size is larger than the minimum number of 130 samples based on the calculation of G*power version 3.0 (four predictors, effect size is set at .15, and power is at .8). 70.6% respondents were females (n = 120), and 29.4% were males (n = 50). Their ages range from 18 to 25 years old (M = 21.37, SD = 1.3).

Instrument

The online survey form consists of four sections: demographic information and three scales to measure perfectionism, coping strategies and academic adjustment.

Demographic Information. Participants were asked to fill in their ages, educational background, gender and nationality in this section.

Short Almost Perfect Scale. The short version of Almost Perfect Scale-Revised [28] was used in this study. It contains eight items that include two subscales with four items each. The two subscales are labelled as standard and discrepancy. A sample item of the standard subscale is "I have high expectations for myself", and a sample item of discrepancy subscale is "Doing my best never seems to be enough". Participants were asked to tick a box in a 7-Likert point scale for each item (1: Strongly disagree; 7: Strongly Disagree). A high score in standards contributes to adaptive perfectionism. In contrast, a high mean score in discrepancy indicates maladaptive perfectionism. The internal consistency of the standard subscale is reported as .75, and the internal consistency of the discrepancy scale is reported as .79 [23].

Simplified Coping Style Questionnaire. This instrument was created by Xie [38], and it contains 20 items with two subscales. The first subscale is a positive style that contains 12 items, and a sample item is "try to look on the bright side of things". The second subscale is a negative style that contains eight items, and a sample item is "try to forget the whole thing". Participants need to tick a box in a 4-Likert point scale for each item (1: Never used; 4: Often used). A higher mean score in either aspect indi-

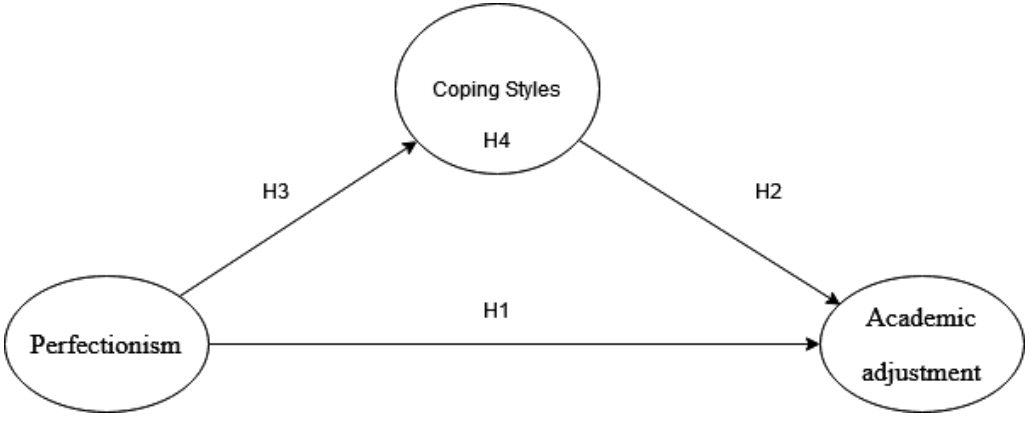

Figure 1. Conceptual Framework

cates more frequent use of the particular coping style. The internal consistency of the scale was reported as .81 [39].

Academic Adjustment Scale. This scale was developed by Anderson et al. [1] and consisted of nine items. There are three subscales in this instrument including academic lifestyle (e.g., I am enjoying the lifestyle of being a university student), academic achievement (e.g., I am satisfied with my ability to learn at university), and academic motivation (e.g., I expect to successfully complete my degree in the usual allocated time frame). There are three items in each subscale. Participants need to tick a box for each item in a 5-Likert point scale (1: Rarely applies to me; 5: Always applies to me). Items 2 and 3 are reverse scored items and thus need to be recoded while computing. A higher mean score suggests a better adjustment in academics. The Cronbach's alpha for the whole scale is .69 [25].

Procedure

After getting approval from the scientific and ethical committee of the university (U/SREC/212/2020), purposive sampling was used to recruit participants who are Malaysian undergraduates. For data collection, an online survey was created using Qualtrics and distributed using a QR code or a link via researchers' social media platforms to the target population. Next, participants were required to read the first page consisting of the study's introduction, the procedures to complete the questionnaire, confidentiality, contact information of the group leader, and the option for agreement to participate in the survey. For those who tick the option of agreeing to participate in the survey, the option would link to the next section that includes demographic information, the Short Almost Perfect Scale, Simplified Coping Style Questionnaire, and Academic Adjustment Scale. The online questionnaire requires approximately 10 to 15 minutes to complete.

Data Analysis

The data was then saved in an excel file. Both the SPSS and SmartPLS programs were used to analyze the data. The SPSS program analyzed descriptive analyses, and the SmartPLS program analyzed the partial least structural equation model. The measurement model assessment was conducted at the first stage to examine the scales reliability and validity. The structural model was conducted at the second stage to examine the hypotheses.

Results

Data Cleaning

Skewness and kurtosis were used to examine the normality of perfectionism, coping strategies and academic adjustment. The skewness and kurtosis values of all measurements were in the range between -2.0 and +2.0 [19], so the normality of the data for all measurements is acceptable (see Table 1).

Table 1

Skewness and kurtosis of the variables

Measure	Skewness	Kurtosis
Adaptive Perfectionism	-.36	-.16
Maladaptive Perfectionism	-.36	-.39
Positive Coping	.16	.53
Negative Coping	.19	.02
Academic Adjustment	-.59	.89

Measurement Model

Construct Reliability. One item in emotion-focused coping was removed as the composite reliability is below the recommended values of .7 [16]. The final composite reliabilities of all the measurements ranged from .73 to .89 (Table 2). Correspondingly, the findings suggested that the latent constructs of all measurements are acceptable.

Table 2

Construct reliability and validity of all measurements

Factors	Total item	Composite Reliability
Maladaptive perfectionism	4	0.86
Adaptive perfectionism	4	0.89
Academic adjustment	9	0.80
Emotion-focused	8 (removed one item)	0.73
Problem-focused	12	0.79

Discriminant Validity. HTMT ratio was used to examine the discriminant validity. Henseler et al. [17] suggested that the HTMT ratio above .85 can be regarded as low discriminant validity. As shown in Table 3, the discriminant validities of all measurements are below .85.

Coefficient of Determination, Effect Size and Collinearity Statistics of Measurements. The results of the analyses were shown in Table 4. The variance inflation factor of all scales as also below 5, indicating no collinearity issue was found [15]. Besides, the results also reveal a large effect size of the predictors on academic adjustment and a medium effect size of perfectionism on emotion and problem-focused coping [9]. The main effect size among the predictors is from the maladaptive perfectionism on emotion-focused coping and from the adaptive perfectionism on problem-focused coping.

Structural Model

As shown in Table 5, after controlling gender and age, adaptive perfectionism is positively associated with academic adjustment, p<.001, whereas maladaptive perfectionism is negatively associated with academic adjustment, p<.001. Besides, problem-focused coping strategy is positively associated with academic adjustment, p=.01, whereas emotion-focused coping strategy is negatively associated with academic adjustment, p<.001. Moreover, adaptive perfectionism is positively associated with problem-focused coping strategy but negatively associated with emotion-focused coping strategy, ps<.001. However, maladaptive perfectionism is positively associated with emotion-focused coping strategy, p<.001, but negatively associated with problem-focused coping strategy, p=.01.

Table 3

Discriminant validities of all measurements (HTMT)

	1	2	3	4
Maladaptive Perfectionism				
Adaptive Perfectionism	.47			
Academic adjustment	.40	.41		
Emotion focused	.40	.20	.54	
Problem focused	.24	.43	.50	.43

Table 4

Coefficient of determination (r^2), effect size (f^2) and collinearity statistics (VIF) of measurements

Exogenous	Endogenous	R^2	f^2	VIF
Academic adjustment		.41		
	Maladaptive Perfectionism		.14	1.34
	Adaptive Perfectionism		.13	1.44
	Emotion-focused		.08	1.22
	Problem-focused		.05	1.26
Emotion-focused		.16		
	Maladaptive Perfectionism		.17	1.10
	Adaptive Perfectionism		.08	1.10
Problem-focused		.18		
	Maladaptive Perfectionism		.04	1.10
	Adaptive Perfectionism		.21	1.10

Table 5

Results of the Structural Equation Modelling (one-tailed test)

	Hypothesis	Beta	Std Error	T value	P Values
Academic adjustment					
Adaptive perfectionism -> Academic adjustment	H1a	.33	.09	3.61	< 0.001
Maladaptive perfectionism -> Academic adjustment	H1b	-.33	.08	4.16	< 0.001
Problem focused -> Academic adjustment	H2a	.19	.08	2.25	.01
Emotion focused -> Academic adjustment	H2b	-.24	.07	3.34	< 0.001
Problem-focused					
Adaptive perfectionism -> Problem focused	H3a	.43	.07	6.52	< 0.001
Maladaptive perfectionism -> Problem focused	H3b	-.18	.08	2.27	.01
Emotion-focused					
Adaptive perfectionism -> Emotion focused	H3c	-.27	.07	3.66	< 0.001
Maladaptive perfectionism -> Emotion focused	H3d	.39	.07	5.57	< 0.001
Mediating effect					
Adaptive perfectionism -> Problem focused -> Academic adjustment	H4a	.08	.04	2.16	.02
Adaptive perfectionism -> Emotion focused -> Academic adjustment	H4b	.06	.03	2.25	.01
Maladaptive perfectionism -> Problem focused -> Academic adjustment	H4c	-.03	.02	1.45	.07
Maladaptive perfectionism -> Emotion focused -> Academic adjustment	H4d	-.09	.03	2.80	< 0.001
Control variables					
Gender		.10	.07	1.48	.07
Age		-.04	.08	.50	.31

Mediating Effect. As shown in Table 5, the specific indirect effects of adaptive perfectionism on academic adjustment through the problem and emotion-focused coping strategies are significant, ps=.02 and .01. Besides, since the direct effect of adaptive perfectionism on academic adjustment is also significant, p<.001 indicates a complementary mediating effect [43]. However, only the specific indirect effects of maladaptive perfectionism on academic adjustment through emotion-focused coping strategies are significant, p<.001. Since the direct effect of maladaptive perfectionism on academic adjustment is also significant, p<.001 also indicates a complementary mediating effect [43]. There is no significant specific indirect effect of maladaptive perfectionism on academic adjustment through problem-focused coping strategies, p=.07.

Discussion

This study adopts the personality-coping-outcome theory as a framework to examine the associations among these three variables and whether coping strategies mediate the effects of perfectionism on academic adjustment. For the first research question, the results of this study also found significant associations between perfectionism and academic adjustment, in which adaptive perfectionism is positively associated with academic adjustment and maladaptive perfectionism is negatively associated with academic adjustment. These findings are similar to the findings of Lapoint and Soysa [20]. For the second research question, our findings also showed significant positive associations between problem-focused coping and academic adjustment. However, different from Cousins et al. [11] and Iruloh and Ukaegbu [18], our findings

also showed a significant negative association between emotion-focused coping and academic adjustment. Overall, our results are consistent with our hypothesis that academic adjustment is associated with perfectionism and coping strategies. Importantly, both the perfectionism and coping strategies account for the large effect size of academic adjustment, r^2=.41 [9].

For the third research question, our results also found significant associations between perfectionism and coping strategies, that adaptive perfectionism is positively associated with problem-focused coping but negatively associated with emotion-focused coping. In contrast, maladaptive perfectionism is positively associated with emotion-focused coping but negatively associated with problem-focused coping. Medium to large effect size was found in the association between maladaptive perfectionism and emotion-focused coping and between adaptive perfectionism and problem-focused coping. These findings are consistent with the findings of Zhang and Zhao [41], who surveyed Chinese undergraduate students, and Larijani and Besharat [21], who surveyed Iran undergraduate students. The consistency indicates the robustness of the associations.

The fourth research question is about the mediating effects of coping strategies. Our results showed that both the problem-focused and emotion-focused coping strategies are the mediators for the effects of adaptive perfectionism on academic adjustment. These results indicate that besides the direct effect of adaptive perfectionism on academic adjustment, the indirect effect of coping strategies also influences their relationships.

However, the results only partially support the mediating effect of coping strategies on maladaptive perfectionism and academic achievement. Maladaptive perfectionism is more likely to have poorer academic adjustment, partly because they are more likely to use emotion-focused coping strategies. However, the relationship between maladaptive perfectionism and academic adjustment is not relevant to problem-focused coping strategies. In other words, the use of problem-focused coping strategies did not help to improve academic adjustment among maladaptive perfectionism.

Conclusion

Overall, the findings of this study support the predictions based on the personality-coping-outcome theory that coping strategies mediate the effects of perfectionism on academic adjustment. Adaptive perfectionism is more likely to use problem-focused. However, maladaptive perfectionism is more likely to use emotion-focused coping strategies, and such coping strategies have influenced their adjustment in academic life.

Implications

In terms of practical implication, the findings suggested the importance of coping strategies in academic adjustment. More use of problem-focused and less emotion-focused coping strategies can assist both adaptive and maladaptive perfectionism students in adjusting better. Accordingly, awareness programmes can be provided to students to increase their knowledge of coping strategies and understand the advantages and disadvantages of different coping strategies. Besides, workshops can be provided to students to train them to use problem-focused coping strategies while facing academic adjustment issues.

In terms of theoretical implication, the findings indicate the importance of coping strategies that associate personality and its outcomes. Most personality theories have mentioned personality influences on outcomes [33] but seldom explore the mechanism that links personality and outcomes. The personality-coping-outcome theory suggests that coping strategies can be a mediator that links between personality and outcomes. The findings of this study support the application of the theory in the areas of academic adjustment. Even though personality is mostly formed through nature and thus hard to change, training of coping strategies can still be possible to change the direct effect of personality on academic adjustment.

Limitation

The interpretation of the study should be cautious. As the sample is recruited from a university in Malaysia, and the purposive sampling method was used in the study, the results may not generalize to undergraduates in other institutions. Future studies may need to recruit more samples

from diverse settings, demographics, and academic backgrounds to examine the robustness of the findings. Besides, as the data is collected using a cross-sectional design that only a statistical mediator can be proposed, future studies may need to use an experimental design to examine the cause-effect explanation and the mediating effect [31].

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Получена 24.08.2021
Принята в печать 30.08.2022

Received 24.08.2021
Accepted 30.08.2022

Психологическая наука и образование
2022. Т. 27. № 5. С. 69—84
doi: https://doi.org/10.17759/pse.2022270506
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 69—84
doi: https://doi.org/10.17759/pse.2022270506
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Approach to Modeling Inclusive Environment in Educational Organization

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The article focuses on the problem of modeling inclusive educational environment as a complex system object in which the system-forming relation is the connection between support and active participation of all participants of the educational environment, taking into account the diversity of educational needs. The empirical research data presented in the article illustrate the theoretical provisions that special educational conditions as support measures for students with disabilities can become the basis for their active participation in the educational process, provided that a subjective request for support is formed based on the reflection of the students' own interests and difficulties. The sample included 8 institutions of secondary vocational education (N=1811 students, 17.3% of them with a status of disability or SEN). Throughout the sample, forms of work organized in a vocational educational organization (VEO) and support options were significantly less demanded by students ($p<0.05$) as compared to the opportunities provided. The level of difficulties recognition in the students varied between "never"/"rarely" and "rarely"/"sometimes". The found paradoxical statistically significant ($p<0.01$) positive relationship (from weak to moderate) between the experienced level of support and the student's desire to leave VEO is discussed. Strategies for modeling the inclusive educational environment are considered, and prospects for studying its technological support are outlined.

Keywords**:** inclusive educational environment, systemic approach, modeling, system-forming factor, participation, support, agency, special educational needs.

Funding. The study was carried out within the framework of the state task of the Ministry of Education of the Russian Federation dated 04/08/2022 No. 073-00110-22-02 "Scientific and methodological support for the development of an inclusive educational environment in the system of general and vocational education".

Acknowledgements. The authors are grateful to L.M. Prokopyeva for her help in collecting data for the study and in conducting statistical analysis.

For citation: Alekhina S.V., Samsonova E.V., Shemanov A.Yu. Approach to Modeling Inclusive Environment in Educational Organization. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2022. Vol. 27, no. 5, pp. 69—84. DOI: https://doi.org/10.17759/pse.2022270506 (In Russ.).

Подход к моделированию инклюзивной среды образовательной организации

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Представлена проблема моделирования инклюзивной образовательной среды как сложного системного объекта, где системообразующим отношением выступает связь условий поддержки и активного участия всех субъектов образовательной среды с учетом разнообразия образовательных потребностей. Полученные в эмпирическом исследовании данные иллюстрируют теоретические положения о том, что специальные условия в качестве мер поддержки обучающихся с ограниченными возможностями здоровья (ОВЗ) могут становиться основой их активного участия в образовательном процессе при условии формирования субъектного запроса на поддержку на основе рефлексии своих интересов и трудностей. Выборка исследования включала 8 организаций среднего профессионального образования (N=1811 студентов, из них 17,3% со статусом инвалидности или ОВЗ). Установлено, что на всей выборке организуемые в профессиональной образовательной организации (ПОО) формы работы и варианты поддержки были востребованы студентами значительно меньше ($p<0,05$) предоставленных возможностей. Уровень признания студентами имеющихся трудностей был между «никогда» и «редко» или «редко» и «иногда». Обсуждается обнаруженная парадоксальная статистически значимая ($p<0,01$) положительная связь (от слабой до умеренной: $\rho=0,264$; $\rho=0,482$) между переживаемым уровнем поддержки и желанием студента уйти из ПОО. Рассмотрены стратегии моделирования инклюзивной образовательной среды и намечены перспективы исследования ее технологического обеспечения.

Ключевые слова: инклюзивная образовательная среда, системный подход, моделирование, системообразующий фактор, участие, поддержка, субъектность, особые образовательные потребности.

Финансирование. Исследование выполнено в рамках государственного задания Министерства просвещения Российской Федерации от 08.04.2022 № 073-00110-22-02 «Научно-методическое сопровождение развития инклюзивной образовательной среды в системе общего и профессионального образования».

Благодарности. Авторы выражают признательность Л.М. Прокопьевой за помощь в сборе данных для исследования и в проведении их статистического анализа.

Для цитаты: *Алехина С.В., Самсонова Е.В., Шеманов А.Ю.* Подход к моделированию инклюзивной среды образовательной организации. Психологическая наука и образование, 2022. Том 27 . No 5 . С . 69—84 . DOI: https://doi.org/10.17759/pse .2022270506

Introduction

The education system of the Russian Federation is striving for inclusiveness, having legislated this right and providing it with strategic documents, namely with interdepartmental comprehensive plans for the development of inclusive education until 2030. One of the objectives of these documents is to develop a basic model of an inclusive educational organization, considering the specifics of all levels of education [11; 12; 13]. At the same time, the model should become the basis for discussing the characteristics of an inclusive environment with all stakeholders, as well as for designing a real environment and building a system for its dynamic assessment and measurement. From our point of view, the solution of the problem of modeling an inclusive educational environment (IEE) is faced with inconsistency, complexity, and the systemic nature of the object itself.

The purpose of this article is to define an approach for theoretical understanding of the concept of IEE and building a basic model of IEE at the level of an educational organization (EO), as well as to illustrate the main characteristics of this approach based on empirical research.

As part of the conceptual and theoretical stage of modeling [20], we analyzed the papers devoted to the study of IEE. This analysis made it possible to conditionally combine them into two divergent approaches.

Within the framework of the first of them, the attention of scientists is mostly drawn to the component composition of the environment [3; 4; 32; 33; 35]. At the same time, the educational environment is considered rather as a set of components that characterize different aspects of the inclusiveness of the environment, which can be assessed by factor analysis [32]. So, when choosing several criteria of inclusiveness (accessibility, variability, tolerance, etc.) and a number of components of the environment (subject, software-technological, social, etc.), its inclusiveness will be determined through the assessment of each component for each criterion separately and summation the results obtained. The question of on what basis the criteria for inclusiveness are chosen is decided in advance and acts as a prerequisite for the analysis of the environment. With this approach to the definition of the inclusiveness of the educational environment, the whole of it appears as a simple sum of its parts, where the quality that unites it is introduced by the external reflection of the researcher and is not considered as a *new qualitative state* generated by relationships within the very set of elements of the educational environment [33].

In this case, the actor who is “placed” in it, the teacher or student, also turns out to be an agent external to the environment, who can more or less successfully use the conditions given to him. A similar type of functioning of the components of the environment of the agents of educational activity, in which these components are set as only *external conditions* for the activities of the actors, V.A. Yasvin suggests calling it an educational *space*, not an educational *environment* [26, p. 33—34].

Within the framework of the second methodological approach to the definition of the concept of the educational environment, the emphasis is on whether the elements of the environment form a whole system. The principle of system consistency is clearly formulated in the work of A.V. Petrovsky and M.G. Yaroshevsky: “System consistency is an explanatory principle of scientific knowledge, requiring the study of phenomena in their dependence on the internally connected whole that they form, acquiring new properties inherent in this whole ... [16, p. 350]” (quoted from: [7, p. 6]).

The turn to the systemic methodology of the analysis of IEE is because the main methodological paradigm of modern Russian federal state educational standards is the systemic-ac-

tivity approach to teaching, which has become the dominant of Russian pedagogy since 1985. This was an attempt to explicitly combine the principle of system consistency, which was developed in the studies of the classics of our domestic psychology (such as B.G. Ananiev, B.F. Lomov, M.G. Yaroshevsky, A.V. Petrovsky and others), and the activity approach (which has always been implicitly systemic), developed by L.S. Vygotsky, L.V. Zankov, D.B. Elkonin, V.V. Davydov and many others. But, accepting the principle of system consistency as explicit, it should also be recognized that some relationships and connections between elements in the system as an interconnected whole should be system-forming [19].

What, within the framework of the second approach, can be considered a backbone component for an inclusive educational environment?

The basic documents on inclusive education state that "the ultimate goal of inclusive education is that each individual can have an effective *participation* in society and develop their potential" [18, p. 6], which implies that both in international documents on inclusive education and in studies on this topic, high importance is attached to the participation of students in IEE and their involvement in common activities (see also [9; 25; 29; 30; 31; 35; 36; 37; 38; 39]). The importance of participation in the modern world is also evidenced by the degree of generalization of this concept in relation to the understanding of the current cultural situation, which the American philosopher Henry Jenkins describes as a culture of participation [6].

We assume that the *system-forming quality* for an inclusive educational environment is the active inclusion in the educational process of all its participants (teachers, special educators, students with special educational needs, their normatively developing peers, parents) as agents of their activity who are able to change and rebuild the environment, developing themselves and transforming the totality of external conditions in the environment into their actual capabilities, taking into account the diversity of needs.

With such an understanding of the systemic property of an inclusive educational environment, in our opinion, the concept of the environment as providing opportunities (affordance, according to J.J. Gibson) for the activity of the subject, proposed by V.A. Yasvin [26, p. 32]. He considers as its systemic property the creation in the educational environment of the possibilities for the implementation by each student of his agentic position. In this case, the environment acts not without regard to the actor, but in relation to her/him, it acts as a whole system that includes the agent acting in it, and the environment is defined as providing to the actor with the affordances to work in it. Thus, the characteristics of the environment are transformed from external conditions into directions of active, conscious participation in its transformation in the course of the agent's realization of her/himself, her/his intentions and goals, together with other acting actors of education [26].

For the principle of active participation as a system-forming principle of creating an inclusive educational environment to become a real basis for its modeling, the next step is to conceptualize and operationalize this principle.

We consider the conceptualization of the principle of participation based on the cultural-historical concept of L.S. Vygotsky. According to this concept, the child's cultural development occurs in the process of assimilation of historically developed forms and methods of activity. It means the result of the action of the environment is largely determined by the degree to which a person comprehends this environment, the meaning in which it acts for him, which leads to the birth of a person as a social individual, i.e. to human socialization. The process of comprehension and rethinking of the surrounding world by a person requires certain means, the main of which is L.S. Vygotsky considers communication, since it is it that causes a person to need to use various signs (linguistic, graphic, mathematical, artistic, etc.), which ensure the formation of higher mental functions in a person, contributing to the emergence of new ways of thinking, mastering cultural means of behavior. In this sense,

the educational environment acts as a system of cultural signs, which for the students should appear as a means of controlling their mental functions and building relationships with the world, with people around them, with themselves [5]. This happens if the organization of the educational environment maintains the position of active participation in the educational activities of students together with teachers and other actors of the environment, in which these actors consciously use the available resources [31].

Support becomes especially important to ensure the participation of students with disabilities, since, due to the limited resources available to them in the surrounding cash environment, the degree of their independent participation is reduced. The principle of active participation of students with disabilities in IEE is widely discussed in the works of many domestic researchers [3; 10; 15; 16; 24; 25]. At the same time, the authors rightly point out the problem of a formal attitude to the construction of an inclusive environment as a system of conditions for students with disabilities who find themselves passive in it, since they are "placed" in the conditions prepared for them, without taking part in their creation, but being only consumers of these conditions [3; 25]. Sharing this position, we believe that participation in this case should be understood primarily as the activity of students in building their individual educational route, independently choosing their extracurricular activities, realizing their interests and difficulties, and requesting the necessary types of support.

In the preface to the book by D.A. Leontiev and co-authors S.V. Alekhina writes: "At the heart of the inclusive practice of education is the principle of support, which requires the organization of psychological support for both students with disabilities and all those who work with them. Of all the possible ways of solving this problem, the most effective are those in which the student's personal potential and his internal coping resources are actualized" [1, p. 4].

Thus, the role of the system-forming relation of the IEE is the connection of support and participation, which turns environmental conditions into affordances for the educational activities of its actors.

The operationalization of the IEE model as a research task can go in several directions. One of them is the inclusion of actors of the environment, focused on its change, in the study of the environment itself together with researchers. This type of research is called participatory [24; 28]. The Institute of Problems of Inclusive Education (IPIE) MSUPE conducted a similar study as part of testing the methodology for self-assessment of the inclusiveness of the school environment of an educational organization to develop it [2]. Another direction of operationalization of the matter of modeling can be the analysis of the correlation between support and participation of students in the educational process. To concretize this correlation, we use data from another study of the IPIE MSUPU, some of the results of which are given below.

Methods and Sample of the Empiric Study

The study was conducted by the Institute of Problems of Inclusive Education of Moscow State University of Psychology and Education in eight institutions of secondary vocational education (SVE) in the Pskov region and the Krasnoyarsk Territory. Representatives of the administration, teachers and students of educational institutions of secondary vocational education participated in the study. For this work, the answers to the online questionnaire for students were selected. The sample consisted of 1811 students, of which 17.3% have a status of disability. Some of the results are shown on the example of two vocational organizations. We reviewed research data from a college from the Pskov region (189 students, of which 11.1% are students with disabilities) and a technical school from the Krasnoyarsk Territory (188 students, of which 49.5% are with disabilities), which differ significantly from each other in the profile of education and the number of students with disabilities (there is a statistically significant difference in the number of students with disabilities according to the Fisher angular test, $p<0.01$).

The questionnaire for SVE students consists of 20 closed questions. The Likert scale was used in the answers to some questions (explanations are given in the description of the results). For analysis, we chose those questions that allow us to correlate the support conditions created in SVE organizations with the degree of participation and demand for these conditions by students. The questions concerned interests, difficulties, forms of activity offered by the organization and participation of students in them, the possibility of contacting the staff of professional educational organizations for support and help, and real requests from students, and one of the questions was about the desire to change the educational organization.

The processing of the obtained quantitative data was carried out using the Excel program on a comparative analysis of questionnaire forms. When working with the data, the following were used: grouping, average values, frequency distribution, correlation analysis (using of the Spearman correlation coefficient ρ), comparative analysis: a comparison of a college and a technical school in terms of the number of students with disabilities was carried out using the Fisher angular criterion; comparison between groups of respondents on relevant questions, as well as within the same group between answers to the question of the possibility of participation and actual participation was carried out using non-parametric Mann-Whitney and Wilcoxon tests.

Results and Discussion

The data presented in Table 1 show that when certain conditions are created in an organization aimed at supporting their initiative and activity, they are far from being fully demanded by students, i.e. do not become real opportunities for them, as agents of the educational process, to exercise their activity and participation (Table 1).

The questions proposed in the questionnaire made it possible to identify, using the examples of VEO (a college from the Pskov region and a technical school from the Krasnoyarsk Territory), possible factors that may influence the participation of students (Tables 2, 3).

A comparison of tables 2 and 3 shows that students show a higher degree of participation in those areas of the activity that are more interesting to them. College students seem to be more interested in individual and group forms of learning activities (judging by the relatively higher demand for individual projects — 28% of 69.3% (Table 3), as well as a more pronounced interest in forms of work in small groups (Table 2)), and the students of the technical school are more interested in social work and activities related to active communication (holidays, sports, volunteering) (Table 3). The areas of interest of SVE students are also indicated by the higher figures of their participation in various forms of work in comparison with the perceived opportunities for participation (Table 3). It can be seen from these data that the lowest participation opportunity to actual participation ratios, indicative of greater interest in participation, in the case of the college are for individual projects and participation in work teams (opportunity to actual participation ratios of less than 3 and 4, respectively), which, apparently, is more related to educational activity, and in the case of a technical school is more related to social work and the sphere of communication (the ratio of opportunities to real participation is less than 3).

Thus, it can be noted that in the organization of various forms of participation, it is necessary to correlate them with the interests of students. This requires the involvement of students in the planning of their educational trajectory, which includes activities to realize their interests and difficulties, as well as ways to implement and overcome them. However, the proportion of students participating in such planning, both in the entire sample (13.8%) (Table 1), and in college (11.1%) and technical school (17.6%) (Table 3), is small.

Difficulties proposed for assessing their presence in VEO on a scale of their manifestation (the Likert scale was used: never — 1, rarely — 2, sometimes — 3, often — 4), are noted by students in the meaning from “never” to “rarely” and “sometimes”. Moreover, if learn-

Table 1

Relation between the Forms of Work Organized in VEO for Student Participation and the Actual Participation of Students in These Forms

Indicate in which forms of work you have the opportunity to participate and in which you are already participating	Opportunity to participate (OP), %	Already participating (AP), %	OP/AP
in individual projects	67.9	22.2	3.06
in planning (individualization) of their educational trajectory	50.5	13.8	3.66
in volunteer movement	60.4	15	4.03
in work teams	51.1	13.4	3.81
in student council	56	14.1	3.97
in managing council	45.3	11.3	4.01
in design of the object-spatial environment	49	11.8	4.15
in circles of additional education	58.3	15.3	3.81
in the work of the admissions committee	41.6	10.8	3.85
in holding events for peers of their own and other institutions	55.1	13.3	4.14
in celebrations and concerts	62.3	17.8	3.5
in sport events	64.8	19.9	3.26
in career guidance events	51.1	11.5	4.44
in professional skill competitions, Abilympics, WorldSkills	53	13.5	3.92
in organization of new circles and sport sections	49	10.7	4.58
in Programs “Vocational training without borders”	44.2	10.5	4.21
in socially significant projects	48.8	11	4.44
in presenting interesting information about VEO on their pages in social networks	55.3	12.5	4.24

Note: All differences between opportunities to participate and actual participation were statistically significant using the Mann—Whitney and Wilcoxon tests ($p<0.01$).

Table 2

Comparison of the Interest of College and Technical School Students in Pedagogical Technologies

Indicate which pedagogical technologies arouse your interest in the classroom and in extracurricular activities	College, %	Technical school, %
Project work	28.6	26.1
Distant learning	50.3*	34.0*
Portfolio	4.8	8.5
Individual tasks	28.6	25.0
Performing tasks in small groups	35.4**	24.5**
Doing tasks in pairs	44.4	45.7
Research work	20.6	22.3
Professional samples	19.0	26.1

Note: An asterisk indicates statistically significant differences between college and technical school on the relevant question at $p<0.01$; two asterisks — at $p<0.02$ according to the Mann—Whitney and Wilcoxon criteria.

Table 3

Opportunity to Participate in Various Forms of Work and the Real Demand for these Forms in two VEOs

Indicate in which forms of work you have the opportunity to participate and in which you are already participating	VEO					
	College			Technical school		
	Opportunity to participate (OP), %	Already participating (AP), %	OP/AP	Opportunity to participate (OP), %	Already participating (AP), %	OP/AP
in individual projects	69.3	28.0*	2.475	66.5	17.6*	3.78
in planning (individualization) of their educational trajectory	53.4	11.1	4.81	53.7	17.6	3.05
in volunteer movement	74.1[a]	16.9*	4.38	62.2[a]	25.5*	2.44
in work teams	60.3	15.3	3.94	55.3	18.6	2.97
in student council	57.1	15.3	3.73	51.6	19.7	2.62
in managing council	48.1	9.5**	5.06	49.5	19.7**	2.51
in design of the object-spatial environment	48.7	10.6	4.59	50.5	16.0	3.16
in circles of additional education	61.9	13.2**	4.69	56.4	29.3**	1.92
in the work of the admissions committee	44.4	8.5*	5.22	44.7	16.5*	2.71
in holding events for peers of their own and other institutions	61.4	11.6*	5.29	59.6	19.7*	3.02
in celebrations and concerts	68.8	15.9**	4.33	63.8	27.1**	2.35
in sport events	70.9	16.4*	4.32	70.2	26.6*	2.64
in career guidance events	57.1	9.5	6.01	52.7	14.9	3.54
in professional skill competitions, Abilympics, WorldSkills	57.1	13.2	4.32	51.1	19.1	2.68
in organization of new circles and sport sections	50.3	8.5	5.92	51.6	11.7	4.41
in Programs “Vocational training without borders”	45.0	8.5	5.29	48.9	14.9	3.28
in socially significant projects	54.0	9.5	5.68	53.2	14.4	3.69
in presenting interesting information about VEO on their pages in social networks	57.7	9.0*	6.41	53.7	16.5*	3.25

Note: Opportunities to participate in college and technical school and actual participation in college and technical school were compared in pairs; statistically significant differences, according to the Mann—Whitney and Wilcoxon tests, between opportunities for participation in college and technical school are marked with the letter “a”: [a] ($p<0.05$), and between actual participation in college and technical school are marked with one asterisk ($p<0.05$) and two ($p<0.01$).

ing difficulties in VEO ranged on average in the range from “rarely” to “sometimes”, then communication difficulties ranged from “never” to “rarely” (Table 4).

Perhaps these difficulties are not significant for students, or they do not want to admit them in their answers. If the difficulties listed for evaluation are not relevant for

Table 4

The Frequency of Students' Difficulties across the Sample

Indicate how often you experience difficulties	Never, %	Rarely, %	Some-times, %	Often, %
when studying several disciplines	26.7	39.5	28.6	5.2
when memorizing learning material	18.3	37.8	34.2	9.7
in preparation for homework	30.1	40.3	22.5	7.1
speaking at the blackboard	24.1	34.7	25.3	15.8
when writing tests	17.2	39.2	32.3	11.3
during industrial training	37.6	38.6	19.2	4.6
in the movement around the educational building	69.4	18.6	8.3	3.7
communicating with other students	61.3	23.5	10	5.1
in communication with students with disabilities	63.2	23.1	9.4	4.3
in communication with students from migrant families	70.4	18.4	7.5	3.7
when interacting with teachers	52.7	29.8	13.8	3.7
in communication with the other sex	62.7	22.1	10.5	4.6
in self-regulation of emotions and behavior	56.3	25.8	13	5

students, then the wording of the difficulties themselves needs joint reflection with students. At the same time, if difficulties are not reflected or recognized by students, then a request for support is not formed (formulating a request would mean recognizing the difficulty in front of oneself and peers). This is shown by the data in Table 5, obtained for the entire sample, from which it is clear that students have the opportunity to seek support from various specialists, but in reality, this is done by a relatively small proportion of them.

At the same time, the frequency of requests for advice and assistance to teachers, the class teacher and masters of industrial training far exceeds the frequency of requests to support specialists (psychologist, social educator, teaching or technical assistant, educator).

Analysis of the data for the two selected VEO shows that the frequency of requests for help from teachers was rather higher ($p = 0.062$) in the college (42.9%) than in the technical school (33.5%), and in the technical school it was significantly higher ($p<0.01$) the rate of referral to a social educator (32.4%) and educator (28.2%) than in college (19% and 16.9%, respectively), which confirms our assumption that the difference may be associated with the great interest of college students in activities related to the educational process (for example, in individual projects: college — 28.0%, technical school — 17.6%, $p<0.05$), and in technical school it is associated with great interest in social work (volunteer movement: college — 16.9%, technical school — 25.5%, $p<0.05$) and activities involving communication — festive, sports and other events (college: 15.9% and 16.4 %, technical school: 27.1%, $p<0.01$ and 26.6%, $p<0.05$, respectively).

At the same time, the degree of recognition of learning difficulties in the forms of learning activity was also higher in college (when studying some disciplines, speaking at the blackboard, writing test papers, interacting with teachers, $p<0.05$), while in the technical school, apparently, difficulties in social communication were more pronounced, judging by a significantly higher ($p<0.01$) than in college level of seeking help from social educators and educators/caregivers and greater difficulties in communicating with students from migrant families ($p<0.05$).

Table 5

Comparison of Students' Answers about the Opportunity to Receive Support and Assistance in VEO and its Actual Receipt

Indicate the consultations and assistance of which workers in VEO you have the opportunity to receive, and you have already received in the current academic year	Opportunity, %	Actual Receipt, %
Administrator	60.1	19.5
Social educator	64.9	19.4
Psychologist	65.3	19.2
Class teacher / curator / department head	65.7	41.5
Teaching assistant	42.2	13
Educator/caregiver	49.8	18.9
Technical assistant	44.2	12.3
Masters of industrial training	64.9	34
Teachers	63.9	37.3

Note: All differences between opportunities to receive support and actual receipt were statistically significant by the Mann—Whitney and Wilcoxon tests ($p<0.05$).

It should be noted that in both VEOs there is a significant moderate negative relationship (correlation) between the difficulties of students and the support of teachers. The relationship of support and difficulties in studying several disciplines, preparing homework, passing industrial training and interacting with teachers in college is moderately negative ($0.3<\rho<0.5$), in other cases it is slightly negative ($\rho<0.3$). At the technical school, there was a moderate negative relationship between difficulties in interacting with teachers and support for teachers. The correlation between these indicators in technical school and in college shows that the less support, the greater the difficulties. In particular, there was a moderate negative relationship between difficulties in communicating with teachers and students' perception of support in college ($\rho=-0.460$, $p<0.01$) or technical school ($\rho=-0.351$, $p<0.01$). Similar data from studies by other authors show that difficulties in communicating with teachers are one of the barriers to the formation of a sense of inclusion in students [37].

In both VEOs, a statistically significant positive relationship (correlation) was also found between the provision of support and the desire of students to change organizations ($\rho=0.482$, $p<0.01$, college; $\rho=0.264$, $p<0.01$, technical school), which looks like a paradox: the greater the support, the greater the desire to change the place of study. Moreover, the positive relationship between the provision of support and the desire to change the place of study is *moderate* in college though weak in technical school. This paradox may turn out to be illusory given the findings of the previous analysis, which argue in favor of a lack of association between support and interests or recognized and perceived difficulties of students. If we assume that support is provided either not at the students' own request, or in a volume insufficient to overcome difficulties, or in the absence of motivation to study and overcome difficulties, which are often not recognized by students, then the desire to change the place of study may be caused not the presence of support, but the lack of its connection with interests and needs. In this case, support will simply be an external statement for the student of his difficulties, which, in the absence of his own request, may prompt him to such an unconstructive strategy for getting out of this situation as a desire to leave.

Conclusion

In conclusion, it should be noted that the design of an inclusive educational environment actualizes the long-standing issue of education. It is the issue of the agency of its participants, sharpening it in the concept of active participation. In this article, we did not set the main task of conducting an empirical study on this topic. Moving in the logic of modeling an inclusive educational environment as a whole system, at the conceptualization stage, we identified two approaches. The first approach considers an inclusive educational environment as a simple sum of adjacent components; such an approach in itself does not lead to solving the problem of building an inclusive educational environment, since it does not achieve the goal of including the participants in the environment as its agents, capable of turning external conditions of support into their actual opportunities. This task is solved within the framework of a different approach, which is based on the definition of a system-forming relationship between the conditions of support and the active participation of all actors of the educational environment in joint activities.

The empirical results of our study illustrate the theoretical position formulated above that the special conditions created in VEO aimed at supporting the initiative and activity of students are in demand in those forms of activity in which students show interest or consciously recognize their difficulties, which illustrates the theoretical provisions of the article on the collected empirical material.

Throughout the sample, despite the significant differences between the VEOs, a common characteristic was clearly observed, namely the degree of real participation of students in the forms of work was noticeably less than the degree of awareness of the possibilities of participation (in the ratio from about 3.08 to 4.58). As these studies have shown, it is in the forms of participation that reflect the interests and perceived needs of students that the conditions of support provided to a greater extent turn into realizable opportunities and ensure inclusion in joint activities.

From our point of view, to move from the conditions created in the educational institution to the opportunities for active participation of students in the educational process, special work is needed to identify, together with students, their interests, difficulties and to form an educational request. In this case, support for the agency of students will be provided, and not only external conditions will be created to meet certain educational needs. Such work requires the use of certain psychological and pedagogical technologies (for example: the technology of jointly distributed activities of teachers and students [9; 17; 22], the technology of a reflexive-activity approach [8], the technology of forming a reflexive movement in theatrical pedagogy within the framework of an inclusive plastic theater [15; 16], the technology of including students in the design of an individual educational route [23]).

The task of building an inclusive educational environment raises many questions. Further research will be focused on the analysis of the correlation of indicators of inclusiveness within the framework of the whole system and the development of technological support within the framework of an approach based on the system-forming relationship between the created special conditions, forms of psychological and pedagogical support and the active participation of all subjects of the educational environment in joint activities.

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Получена 26.06.2022
Принята в печать 29.08.2022

Received 26.06.2022
Accepted 29.08.2022

Психологическая наука и образование
2022. Т. 27. № 5. С. 85—96
DOI: https://doi.org/10.17759/pse.2022270507
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 85—96
DOI: https://doi.org/10.17759/pse.2022270507
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Emotions, Personality Traits and Metacognitions as Predictors of Students' Psychological Well-being in Contemporary Situation

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This study aims to comprehensively explore the emotional, personal, and metacognitive predictors of students' psychological well-being. The article presents the results of identifiesying supporting and dysfunctional factors that affect the level of psychological well-being of the current generation of students. Study sample: 317 people subjects aged 18 to 45 years (average age 20.82) — undergraduate, graduate and postgraduate students. To measure these characteristics, the following methods were used: a short portrait questionnaire of the Big Five; methodology "Differential Scale of Emotions"; methodology for diagnosing the subjective well-being of the individual; Metacognitive Awareness Inventory; Metacognitive behavior self-assessment scale; test "Differential type of reflection"; Cognitive Emotion Regulation Questionnaire and the author's self-assessment questionnaire of metacognitive behavior "Metacognitive skills in the structure of educational and professional activities". It is shown that the level of subjective well-being differs significantly depending on the level of metacognitive involvement. A positive effect is also exerted by a high index of positive emotions, a greater level of extraversion and conscientiousness, and a low level of neuroticism. The data obtained can be helpful in developing programs for forming and reforming individual metacognitive strategies that contribute to successful adaptation and maintaining subjective well-being maintenance.

Keywords: psychological well-being, subjective well-being, metacognitive skills, emotions, personality traits.

Funding. The research has been funded by the Russian Science Foundation (RSF), project № 21-78-00116, at the Don State Technical University.

For citation: Denisova E.G., Ermakov P.N., Abakumova I.V., Sylka N.V. Emotions, Personality Traits and Metacognitions as Predictors of Students' Psychological Well-being in Contemporary Situation. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2022. Vol. 27 no. 5, pp. 85—96. DOI: https://doi.org/10.17759/pse.2022270507 (In Russ.).

Эмоционально-личностные и метакогнитивные предикторы психологического благополучия студентов в современных условиях

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Представлены материалы комплексного изучения эмоционально-личностных и метакогнитивных предикторов психологического благополучия обучающихся, направленного на выявление поддерживающих и дисфункциональных факторов, влияющих на уровень психологического благополучия студентов в современных условиях. Выборка исследования: 317 человек в возрасте от 18 до 45 лет (средний возраст — 20,82) — обучающиеся по программам бакалавриата, специалитета, магистратуры и аспирантуры. Для исследования заявленных показателей использовались следующие методики: короткий портретный опросник Большой пятерки; методика «Шкала дифференциальных эмоций»; методика диагностики субъективного благополучия личности; опросник метакогнитивной включенности в деятельность; Шкала самооценки метакогнитивного поведения; тест «Дифференциальный тип рефлексии»; опросник «Когнитивная регуляция эмоций» и авторская анкета самооценки метакогнитивного поведения «Метакогнитивные навыки в структуре учебно-профессиональной деятельности». Полученные данные показывают, что уровень субъективного благополучия значимо различается в зависимости от уровня метакогнитивной включенности. Установлено, что влияние также оказывают высокий индекс позитивных эмоций, более высокие показатели экстраверсии и сознательности, а также низкие значения нейротизма. Данные проведенного исследования

могут помочь в решении задач формирования и коррекции индивидуальных метакогнитивных стратегий, способствующих успешной адаптации и поддержанию субъективной удовлетворенности.

Ключевые слова: психологическое благополучие, субъективное благополучие, метакогнитивные навыки, эмоционально-личностные характеристики.

Финансирование. Исследование выполнено в Донском государственном техническом университете при финансовой поддержке Российского научного фонда, проект № 21-78-00116.

Для цитаты: *Денисова Е.Г., Ермаков П.Н., Абакумова И.В., Сылка Н.В.* Эмоционально-личностные и метакогнитивные предикторы психологического благополучия студентов в современных условиях // Психологическая наука и образование. 2022. Том 22. № 5. С. 85—96. DOI: https://doi.org/10.17759/pse.2022270507

Introduction

Students of all educational levels are subject to the negative effects of uncertainty and regularly face a number of difficulties that affect their success in mastering educational programs, their satisfaction with the process, well-being and psychological well-being. The specificity of educational activity lies in the impact on the student and the deep connection between academic success and his subjective characteristics. In modern conditions, there is an objective difficulty in taking into account and controlling external environmental factors, which in turn makes internal, subjective factors especially significant. It is these factors that can determine a certain level of functioning and adaptation of a person. At the same time, the education sector today, like many other areas, is in a state of continuous innovation. That, on the one hand, naturally affects, and on the other, depends on the well-being of the main subjects of educational activity. The relationship between the level of psychological well-being and self-efficacy and positive thinking has been studied and described [2; 15], as well as sustainability, mindfulness [24] and academic achievement [19]. However, the complexity and versatility of the very phenomenon of "psychological well-being", as well as the transformational dynamism of the education, to this day leave the question of the factors and conditions for the students well-being open.

Since the situation of the assessment and the requerment to demonstrate a certain level of proficiency in educational content are themselves associated with an increase in tension and stress levels, the situation of knowledge control can be called one of the significant objective factors [2; 5; 12]. The features of pedagogical communication and the relationship of the student with the teaching staff are also significant. It is known that non-constructive communication in the educational process is a risk factor for reducing the well-being of life satisfaction and students [4; 8].

Recent studies suggest that subjective factors include the emotional state, personality traits, features of the motivational-value sphere, satisfaction with learning, affective-cognitive components, and metacognition [4; 13]. It has also been shown that students with a high level of resilience and mindfulness demonstrate higher levels of autonomy and self-acceptance, which, according to researchers, are components of psychological well-being [20].

Samokhvalova A.G. and colleagues on a sample of students of different profiles of education revealed a number of correlations of well-being with the parameters of motivation for creative self-realization, features of thinking, semantic sphere, communicative competence, creativity, reflexivity [12]. In a study with cadets of military universities, it was found that their psychological well-being depends on

the timing of adaptation in new conditions, the characteristics of the worldview, and the feeling of satisfaction with educational, official and personal activities [9]. Rusina S.A. revealed the particular importance of role self-assessment in the psychological well-being of students and found that confidence in the consistency of the student's personal qualities and the characteristics of educational and professional activities. The author also showed that compliance with all the norms and requirements of the educational institution, cause approval and self-recognition in a new social role, and this, in turn , leads to a positive change in the level of psychological well-being of students [11].

On metacognition, recent studies have shown the usefulness of assessing metacognitive skills in predicting the success of learning activities [14; 25], the role of metacognitive regulation in the context of communication is described [1], as well as the role of metacognitive involvement in the system of mental self-regulation of students [10].

Metacognition contains regulatory and reflective components. On the one hand, metacognitive skills cover the ability for self-regulation and self-organization in the process of cognition, on the other hand, the ability to track the process and progress of cognition, as well as self-check the results of activities. It has been established that the development of the abilities of metacognitive regulation of activity directly affects the management of students' own cognition [6]. Danilenko O.I. has identified and described a complex of anticipatory viability: foresight, self-regulation in educational activities and psychosomatic self-regulation. Anticipatory activity, according to the author, is one of the important predictors of academic performance and is interconnected with indicators of subjective well-being [5]. In general, the number of works devoted to metaconions is obviously increasing. Both the metacognitive processes themselves and the skills and strategies of metacognitive behavior are studied [10; 14]. At the same time, despite the rather obvious factorial potential, metacognition is often studied in the structure of educational activity in some isolation from the student's personality, or is considered exclusively in the context of self-regulation.

Thus, in modern conditions, the importance of studying the psychological aspects of the quality of life, personal effectiveness and productivity of educational activities is increasing. The unifying category for these areas is the category of "psychological well-being", which we understand from a systemic standpoint and is understood as an integral socio-psychological entity, including the assessment and attitude of a person to his own life and personality, characterized by a subjective experience of satisfaction. Such an understanding allows, on the one hand, to some extent to use synonymously different terms in which it is customary to describe psychological well-being and its components, on the other hand, to simultaneously take into account these components and present them in a systematic way [7].

The main objective of this work was a comprehensive study of emotional-personal and metacognitive predictors of the psychological well-being of students.

Methods

The study involved students of higher educational institutions of the southern federal district of the Russian Federation - 317 people (68% female) aged 18 to 45 years (average age 20.82). Students of bachelor's and specialist's programs were 80% of the sample, 13% were enrolled in master's programs, 7% were postgraduate students. Data collection was carried out from March 15, 2022 to April 18, 2022 in the format of online testing. All respondents agreed to participate in the study, were informed about its objectives and notified of further use and publication of the results.

To collect the socio-psychological data and measure the use of metacognitive skills, the survey was used. Respondents were asked to indicate gender, age, level of education, field of study and form of study, as well as to assess the severity of educational stress and the success of coping with it. The author's self-assessment questionnaire for metacognitive behavior "Metacognitive skills in the structure

of educational and professional activities" contained 9 questions to assess the use and awareness of the main forms of metacognitive behavior (metaplanning, procedural skills and metacognitive control).

To measure these characteristics, the following methods were used: a short portrait questionnaire of the Big Five (B5-10, Egorova M.S. and Parshikova O.V., 2016); methodology «Differential Scale of Emotions» (SDE, adaptation of Leonova A.V. and Kapitsa M.S., 2003); methodology for diagnosing the subjective well-being of the individual (Shamionov R.M., Beskova T.V., 2018); Metacognitive Awareness Inventory (G. Shrou, R. Dennison, adaptation by A.V. Karpov, 1994); Metacognitive behavior self-assessment scale (D. LaCosta, adaptation by A.V. Karpov, 1998); test "Differential type of reflection" (D.A. Leontiev, E.M. Lapteva, E.N. Osin, A.Zh. Salikhova, 2009); Cognitive Emotion Regulation Questionnaire by N. Garnefsky and V. Kraig (adapted by O.L. Pisareva, 2007).

Statistical methods included: Shapiro-Wilk test, analysis of covariance (ANCOVA), Kruskal-Wallace test. As a post hoc procedure, Dunn's test with Holm's correction for multiple comparisons was used. Statistical analysis of the results obtained was carried out using the freely distributed JASP Computer software (Version 0.16, 2021).

Results

The majority of respondents believe that they face a relatively large amount of stressful situations at school (average for the sample - 5.74 out of 10 points) and cope with the academic load quite well (7.16 out of 10 points). At the same time, self-assessment of the levels of educational stress tends to inversely linear relationship with subjective ideas about academic success (Fig. 1).That is, the higher the students rate the level of academic stress, the worse, in their opinion, they cope with the academic load.

In the study of the main indicators of psychological well-being (Table 1), the highest results were found on the scale of social and normative well-being (mean value 3.87 points). It should be noted that the obtained value corresponds to a high level of this scale, which indicates high assessments of the compliance of their lives with social norms and moral values. The lowest indicators were found on the scale of hedonistic well-being (3.29), which indicates a reduced level of satisfaction of basic needs.

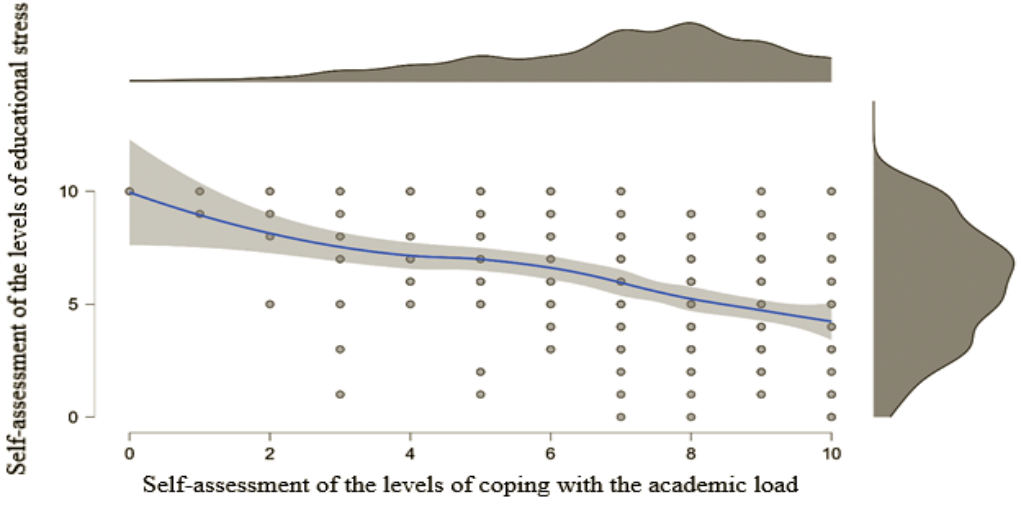

Figure 1. Analysis of the results of the self-assessment of the levels of educational stress and the success of coping with the academic load

At the same time, the established values on the scale of hedonistic well-being, as well as on the scales of emotional well-being (3.60), ego-well-being (3.40) and existential-activity well-being (3.56), correspond to the average values of the severity of these scales. The integral indicator of subjective well-being is also at the average level, which generally characterizes the sample positively.

To study the predictors of subjective well-being of students, an analysis of covariance (ANCOVA) was used, where the level of metacognitive involvement acted as a factor, and the degree of awareness of metacognitive skills and emotional and personal characteristics were considered as covariates (Table 2).

It was shown that the levels of metacognitive involvement ($F = 3.907$ at $p = 0.021$), extraversion ($F = 12.870$ at $p < 0.001$), consciousness ($F = 12.246$ at $p < 0.001$), neuroticism ($F = 9.770$ at $p = 0.002$), self-blame strategies ($F = 4.437$ at $p = 0.036$), positive refocusing ($F = 5.467$ at $p = 0.020$), and positive emotion index ($F = 47.152$ at $p < 0.001$) have a significant effect on well-being. There are also trends towards the significance of the effect for the strategies of positive revision ($F = 3.035$ at $p = 0.083$) and catastrophization ($F = 3.764$ at $p = 0.053$).

The results obtained indicate that the level of subjective well-being differs significantly depending on the level of metacognitive involvement (Kruskal-Wallis Test $H = 70.098$ at $p < 0.001$; Fig. 2).

Post hoc analysis using the Dunn method found that significant differences are observed between all levels of metacognitive involvement (Table 3).

Analysis of the effect of personal characteristics and features of the emotional sphere showed that higher rates of subjective well-being are observed in students with a high index of positive emotions, with more pronounced extraversion, consciousness and low values of neuroticism. It has also been shown that positive refocusing during regulation of emotions has a direct effect on the level of well-being, while the strategy of self-blame has the opposite effect (Fig. 3).

Discussion

The described relationships between the subjective well-being of students and the levels of metacognitive involvement are confirmed by the results of numerous correlation studies of psychological well-being and the characteristics of self-regulation and reflection [10; 17; 26]. The relationship of personal characteristics with the level and components of psychological well-being has also been widely studied. Extraversion and prosocial behavior, along with links to psychological well-being, demonstrate a high potential for more successful adaptation and functioning of a person in many areas of activity [16; 21; 23]. On emotional regulation, it has been established that high indicators of emotional regulation reveal connections both with the level of psychological well-being and contribute to more adaptive options for coping with difficult situations [22]. At the same time, the connection of positive emotions with a high level of psychological

Table 1

The results of the study of the main components of the psychological well-being of students (N=317)

	Mean	Standard deviation
Emotional well-being	3.601	0.761
Existential-activity well-being	3.562	0.728
Ego well-being	3.404	0.829
Hedonistic well-being	3.298	0.760
Socio-normative well-being	3.870	0.620
Subjective well-being	3.547	0.629

Table 2

Results of ANCOVA for predictors of subjective well-being of students

	Sum of squares	Mean square	F	p
The level of metacognitive involvement	1.162	0.581	3.907	0.021
Extraversion	1.914	1.914	12.870	< 0.001
Agreeableness	0.321	0.321	2.160	0.143
Conscientiousness	1.822	1.822	12.246	< 0.001
Neuroticism	1.453	1.453	9.770	0.002
Decreased reflection over cognitive operations	0.002	0.002	0.012	0.912
Degree of awareness using metacognitive skills	0.340	0.340	2.285	0.132
Positive Emotion Index	7.014	7.014	47.152	< 0.001
Anxiety-Depressive Emotion Index Level	0.093	0.093	0.622	0.431
Self-accusation	0.660	0.660	4.437	0.036
Acceptance	0.025	0.025	0.167	0.683
Concentration	0.012	0.012	0.082	0.775
Positive refocus	0.813	0.813	5.467	0.020
Refocusing on planning	0.084	0.084	0.562	0.454
Positive revision	0.451	0.451	3.035	0.083
Place in perspective	0.067	0.067	0.450	0.503
Catastrophization	0.560	0.560	3.764	0.053
Accusation	0.106	0.106	0.711	0.400
Openness	0.016	0.016	0.109	0.742
Residuals	44.028	0.149		
F-statistic: 1.37, df2 = 314.000; p-value: 0.046				

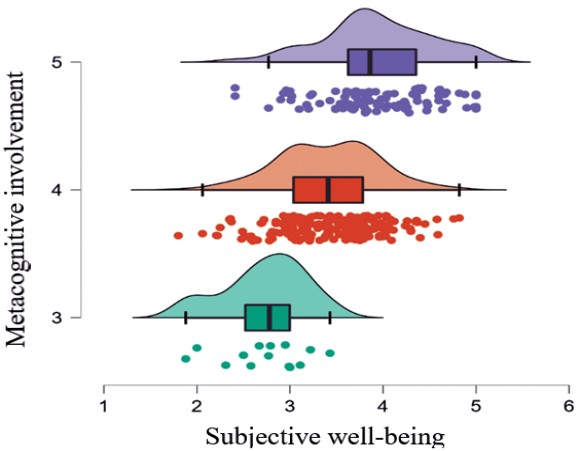

Figure 2. Analysis of the influence of the level of metacognitive involvement on the level of subjective well-being

Table 3

Dunn's Post Hoc Comparisons

Comparison by the level of metacognitive involvement	z	p_{holm}
Intermediate level (3) – Advanced level (4)	-3.654	< 0.001
Intermediate level (3) – High level (5)	-6.486	< 0.001
Advanced level (4) – High level (5)	-6.904	< 0.001

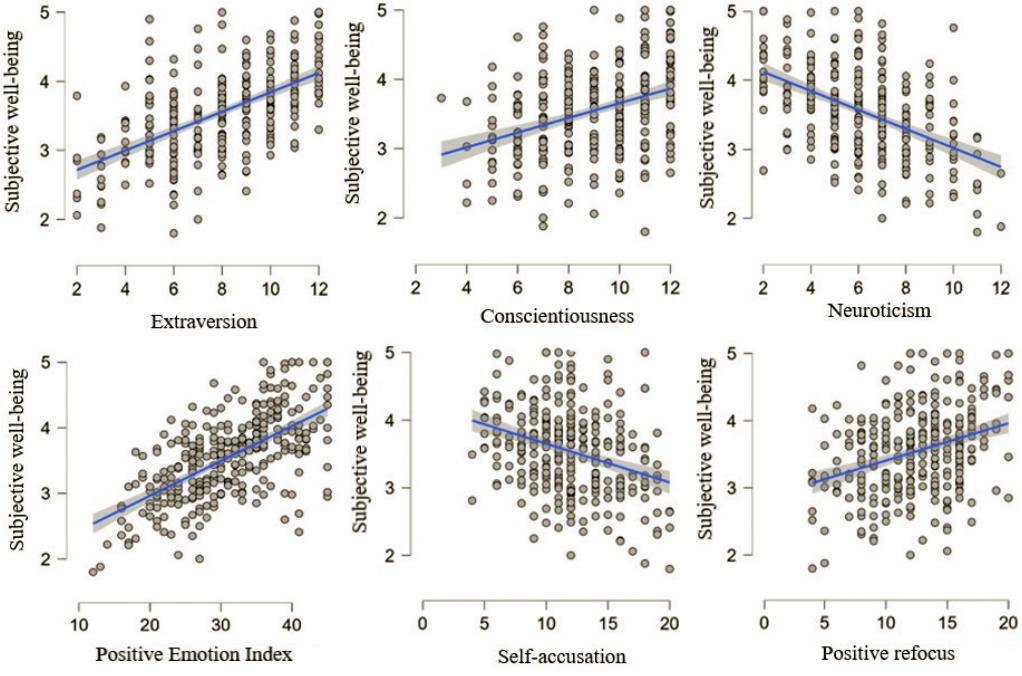

Figure 3. Analysis of the effect of personal characteristics and features of the emotional sphere

well-being seems to be quite obvious. It is also worth noting that positive refocusing and rethinking of the situation themselves are considered to be the most adaptive strategies for cognitive regulation of emotions, which is also supports our result [18].

Based on the above, we can conclude that the data obtained do not contradict the results of studies obtained both on Russian samples and in abroad studies. Our data clarify the place and content of the metacognitive component in the structure of the factors of psychological well-being of students. This determines the scientific value and novelty of our results. It should also be noted that the purpose of the study was to identify universal predictors of student well-being, in this regard, the sample was analyzed in its entirety without dividing the respondents by gender, age and level of education, which is both a significant limitation of this work and represents a further perspective of the study.

Conclusions

The ability to plan, monitor and control the process of learning activities (metacognitive

involvement), as well as focus on the outside world (extraversion) and a higher degree of organization (conscientiousness) have a positive impact on the level of subjective well-being. At the same time, refocusing to the positive aspects of stressful situations and searching for a positive meaning of the events that have occurred for the purpose of personal growth or acquiring new experience has a strong supporting effect. The greatest destructive potential has a high level of neuroticism, a tendency to self-blame in stressful situations and a tendency to not take into account the prospect of using negative experience.

The results of this study can help in the development and correction of individual metacognitive strategies that contribute to successful adaptation and maintenance of subjective satisfaction in changing socio-political and economic conditions.

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Получена 10.05.2022
Принята в печать 22.08.2022

Received 10.05.2022
Accepted 22.08.2022

Психологическая наука и образование
2022. Т. 27. № 5. С. 97—106
DOI: https://doi.org/10.17759/pse.2022270508
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 97—106
DOI: https://doi.org/10.17759/pse.2022270508
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Development of Decoding Abilities in Bosnian-speaking Children: a Two-year Follow-up Study

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Reading is one of the most important academic skills that children master in the early grades of elementary school. The simple view of reading postulates that it consists of decoding abilities and linguistic understanding. The present study aims to explore the development of decoding abilities in the Bosnian language in children from Grade 3 to Grade 5. We assessed the relationships between word reading and pseudoword reading as measures of decoding skills, and phonemic deletion task, rapid automatized naming (RAN) of letters, and RAN of objects as the predictors of decoding skills. The sample for this study comprised 36 children (16 girls, 20 boys). This study's results showed a significant improvement in decoding skills from Grade 3 to Grade 5. The best predictor of word reading in Grade 5 was RAN of objects in Grade 3, followed by RAN of letters in Grade 3. On the other hand, the significant predictors of pseudoword reading in Grade 5 were RAN of objects and the phoneme deletion task in Grade 3. Understanding reading development from Grade 3 to Grade 5 is informative and can help create better reading instruction for all readers.

Keywords**:** reading development, elementary school students, Bosnian language.

Acknowledgments. The authors wish to thank all children who participated in this research.

For citation: Memisevic H., Malec D., Dedic A. Development of Decoding Abilities in Bosnian-speaking Children: a Two-year Follow-up Study. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2022. Vol. 27, no. 5, pp. 97—106. DOI: https://doi.org/10.17759/pse.2022270508

Развитие способностей к декодированию у детей, говорящих на боснийском языке: лонгитюдное двухлетнее исследование

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Чтение является одним из наиболее важных академических навыков, которым дети овладевают в первых классах начальной школы. Само по себе чтение включает в себя способности декодирования и лингвистического понимания. Настоящее исследование направлено на изучение развития способностей к декодированию у детей с 3-го по 5-ый класс, говорящих на боснийском языке. Мы оценили взаимосвязь между чтением слов и чтением псевдослов в качестве меры навыков декодирования, задачами на удаление фонем, быстрым автоматизированным называнием (RAN) букв и RAN объектов как предикторов навыков декодирования. Выборка для этого исследования включала 36 детей (16 девочек, 20 мальчиков). Результаты этого исследования показали значительное улучшение навыков декодирования с 3 по 5 класс. Лучшим предиктором чтения слов в 5-м классе стал RAN объектов в 3-м классе, за которым следовал RAN букв в 3-м классе. С другой стороны, значимыми предикторами чтения псевдослов в 5-м классе выступили RAN объектов и задание на удаление фонем в 3-м классе. Понимание развития чтения с 3-го по 5-ый классы служит информативным источником, способствующим созданию условий для развития навыков чтения в целом.

***Ключевые слова*:** развитие чтения, учащиеся начальной школы, Боснийский язык.

Благодарности. Авторы благодарят всех детей, участвовавших в исследовании.

Для цитаты: *Мемишевич Х., Малек Д., Дедич А.* Развитие способностей к декодированию у детей, говорящих на боснийском языке: лонгитюдное двухлетнее исследование // Психологическая наука и образование. 2022. Том 27. № 5. С. 97—106. DOI: https://doi.org/10.17759/pse.2022270508

Introduction

Learning to read proficiently is one of the most important educational goals in early elementary school grades. Reading performance is an essential prerequisite necessary for student school success [1; 15]. How reading develops is one of the major themes in educational psychology. According to the simple view of reading, it consists of two parts: decoding and linguistic comprehension [18]. Much research has been focused on whether these two skills are dissociable. Correlation studies have indicated that these two skills are separable and that there can be reading comprehension problems in children with adequate decoding skills

[41]. Studies in the English language have shown that the correlation between decoding and reading comprehension is higher in the early grades of elementary school than in the later grades [19]. Also, decoding skills contribute more to reading comprehension at the early grade levels than listening comprehension [23]. However, the exact developmental trajectory of this relationship is still unknown. To better understand how reading develops, it is necessary to understand how beginning readers recognize words accurately and automatically [9]. It is also important to know what factors have effects on reading development. Numerous studies have examined the factors influencing children's reading [38; 43]. The research focused primarily on cognitive-linguistic factors such as phonological awareness, rapid automatized naming, and working memory and psychological factors such as motivation. Many variables have been identified as having a significant impact on reading such as selective attention [29], orthographic ability [42], homework activities [11], motivation [37], metacognition [31], and many others. Additionally, studies have also found the effects of working memory and processing speed on reading, especially reading comprehension [22; 32; 44].

However, two of the most studied variables concerning reading are phonological awareness (PA) and rapid automatized naming (RAN). These two variables were found to be the most important pathways to reading success [34]. PA can be defined as an awareness of the phonological segments of the speech that are closely represented by an orthography [3]. It is important to note that PA is a complex ability consisting of several components. Høien, Lundberg [17] identified three basic components of PA: 1. phoneme factor, 2. syllable factor, and 3. rhyme factor. Out of these, a phoneme factor was most strongly related to reading outcomes. The relationship between PA, especially at the phoneme level, and word decoding abilities has been firmly established [6]. PA has unanimously been identified as one of the most important predictors of reading, regardless of orthography and whether it is alphabetic or logographic language [20; 28; 39]. In a study of several European alphabetic languages (Finninsh, Hungarian, Dutch, Portuguese, and French), authors found phonological awareness to be the main factor associated with reading performance [50].

Another predictor widely examined in relation to reading was rapid automatized naming (RAN). There were some controversies regarding what RAN tasks measure [7]. On the one hand, some authors consider RAN as a part of phonological processing and defined it as the efficiency of phonological code retrieval [46]. On the other hand, research has shown that RAN is a significant independent predictor of reading [14; 49] and is thus a separable construct from PA. The argumentation behind the claim that RAN is a separable construct from phonological processing stems from the following findings: 1. RAN makes a unique, independent contribution to reading; and 2. poor readers can have RAN deficits only, PA deficits only, and RAN and PA deficits [47]. RAN predicts future reading abilities across different ages and languages [26].

One question that needs further elaboration with reference to the role and effects of PA and RAN as predictors of reading during different periods in a person's life and across skill levels. For example, are PA and RAN equally strongly related to reading proficiency from Grade 1 to Grade 8? In a study of Finnish, which is the language with a transparent orthography, the authors found only a minor link between early phonological skills and reading at Grade 2 [36]. Similarly, RAN seems to be a more important predictor in children with a higher level of reading performance [34]. Another important question is how PA and RAN, as the most significant predictors of reading, develop in relation to children's age.

A longitudinal study design is the best way to answer these questions. However, most longitudinal studies have been conducted in English. The question is whether the research in English is relevant to languages with more transparent orthographies [9], that is, whether the skills needed for developing reading are universal across languages [40]. Another question is the size of the relationship of cognitive and linguistic factors such as PA and RAN to decoding skills in different orthographies. One additional problem in answering this question is that studies in different languages have used different measures as proxies for different reading constructs, which makes comparisons with the English language studies only indirectly [10].

Given the importance of PA and RAN on reading achievement, we wanted to examine further

the relationship of these variables with decoding skills in the Bosnian language and how they develop over the period of two years. The Bosnian language has a transparent orthography, with each letter pronounced with the same sound regardless of its position in the word. The present study aims to answer how the relationship between PA, RAN, and decoding skills change from Grade 3 to Grade 5 in the Bosnian language. In addition, we wanted to examine how well PA and RAN in Grade 3 predict decoding skills in Grade 5. There is scant research regarding the growth trajectories of these variables among children learning different alphabetic orthographies [5]. Thus, we wanted to answer the following questions:

1. Were there statistically significant improvements in PA, RAN tasks, and decoding skills from Grade 3 to Grade 5?

2. How do the relationships between decoding skills, phoneme deletion tasks, and rapid automatized naming change from Grade 3 to Grade 5?

3. What are the best predictors of decoding skills in Grade 5 assessed in Grade 3?

Method

Participants

The sample for this study consisted of 36 children (16 girls, 20 boys) who were assessed on reading variables in Grade 3 and Grade 5. The mean age of children in Grade 5 was 10.3 years (SD — 0.5 years). These children represented a subsample from a study on predictors of reading speed and comprehension in the Bosnian language [27]. According to the children's school records, children did not have developmental disabilities or any other neurological or health condition that might influence their learning. None of the children received special educational support at school.

Procedure

We employed a longitudinal study design to assess these reading variables in the same children in Grade 3 and Grade 5. All children in this study attended the same school in Sarajevo. Teachers of the children provided consent forms to the parents. In Grade 3, there were 38 children assessed in this school. In Grade 5, we received 36 consent forms, and these children were tested. Children were tested individually in the morning hours in classrooms available at school. Individual testing lasted about 40 minutes. Testing at Grade 3 took place in November and December 2019 and at Grade 5 — in November and December 2021. The approval for this study was obtained from the Ministry of Education in Canton Sarajevo and the Ethical Board of the Faculty of Educational Sciences at the University of Sarajevo.

Measures

The same tests were used previously in a study of reading predictors in the third-grade children [27]. More specifically, we used the following tests:

1. Word reading. In this task, children were asked to read aloud a list of real words increasing in length. The result is the number of words read correctly in one minute. The test-retest reliability for this kind of task is reported to be high, above .90 [13].

2. Pseudoword reading. As in the previous task, children were asked to read aloud a list of pseudowords increasing in length. The result is the number of words read correctly in one minute. The test-retest reliability for this kind of task was reported to be .84 [8]. These first two tasks served as a measure of decoding skills as they have shown evidence of consistency and validity in predicting reading ability [8].

3. Phoneme deletion task. In this task, children were shown a list of 16 objects and were asked to name the objects without the first sound. Three demonstration items were given prior to the task. The time to name all the objects was used as a result. Faster time indicates better performance. This test measures phonological awareness skills.

4. Rapid automatized naming of Letters (RAN: Letters). This task comprises of five lowercase letters (a, d, o, p, s) that are randomly repeated 10 times in an array of five rows for a total of 50 stimulus items [48]. The psychometric properties of RAN tasks are excellent. According to the RAN manual, interscorer reliability for this task was .98, and test-retest reliability was .90 [48]. Time to name all the letters was recorded, and faster time indicates better performance.

5. Rapid automatized naming of Objects (RAN: Objects). This task comprises of five stim-

ulus items (hand, book, dog, star, and chair) that are randomly repeated 10 times in an array of five rows for a total of 50 stimulus items [48]. Again, the psychometric properties of this task are very good, with test-retest reliability of .84, and inter-scorer reliability .99 [48]. The time to name all objects was recorded, and faster time indicates better performance.

Statistical analysis

We first presented descriptive data for all the tests in Grade 3 and Grade 5, along with paired t-test measures and effect sizes. We then calculated correlations between the variables for both Grade 3 and Grade 5. In addition, we converted all the variables into ranks and calculated Spearman's correlation coefficient. As a dependent variable in the prediction models, we used word reading and pseudoword reading in Grade 5, and as predictors we used phoneme deletion task, RAN: Letters, and RAN: Objects in Grade 3. The statistical analysis was conducted using the statistical package IBM SPSS v.26. [21]. An alpha level of .05 was used for all statistical tests.

Results

Table 1 presents mean scores, paired t-tests and effect sizes for all the variables we used in this study.

As can be seen from Table 1, there has been a considerable, statistically significant improvement in all measures from Grade 3 to Grade 5.

Next, we next present correlations between all variables (Table 2).

Table 1

Mean scores, standard deviations, paired t-test, and Cohen's effect size for all reading variables

Variable	Mean (SD) Grade 3	Mean (SD) Grade 5	Paired t-test[c]	Cohen's effect size
Word list reading[a]	49.6 (13.8)	62.9 (13.9)	12.0	0.96
Pseudo word reading[a]	31.8 (8.1)	39.7 (7.3)	9.8	1.02
Phoneme deletion[b]	68.4 (20.3)	56.2 (17.7)	4.1	0.64
RAN: Letters[b]	27.7 (5.9)	23.1 (3.4)	5.5	0.95
RAN: Objects[b]	49.6 (8.3)	44.4 (8.3)	4.9	0.63

Note: a number of words read in one minute; b time to complete the task in seconds; c all p values less than .001.

Table 2

Correlations between all reading variables

Grades	Variables	Grade 3					Grade 5				
		1	2	3	4	5	1	2	3	4	5
	1. Word list reading	1.00	0.87	-0.54	-0.54	-0.68	0.89	0.79	-0.46	-0.40	-0.60
	2. Pseudoword reading		1.00	-0.55	-0.59	-0.57	0.75	0.81	-0.47	-0.51	-0.53
Grade 3	3. Phoneme deletion task			1.00	0.44	0.36	-0.38	-0.49	0.58	0.33	0.42
	4. RAN letters				1.00	0.44	-0.54	*-0.45*	***0.30***	*0.54*	*0.31*
	5. RAN objects					1.00	-0.69	-0.56	0.39	0.38	0.71
	1. Word list reading						1.00	0.79	-0.37	-0.50	0.54
	2. Pseudoword reading							1.00	-0.56	-0-56	-0.58
Grade 5	3. Phoneme deletion task								1.00	0.37	0.47
	4. RAN letters									*1.00*	***0.29***
	5. RAN objects										1.00

Note. Bold values are not statistically significant. All other p values are statistically significant at p< .05 level except for the relationships: 1. Phoneme deletion at Grade 5 and RAN_Letters at Grade 3; 2. RAN_Objects at Grade 5 and RAN_Letters at Grade 3; and 3. RAN_Objects at Grade 5 and RAN_Letters at Grade 5.

As shown in Table 2, most of the correlations between reading variables were statistically significant. However, an unexpected finding was the lack of correlation between RAN_objects in Grade 5 and RAN_letters in Grade 3 and Grade 5. To better elucidate the stability of the relationship between the variables, we converted them into ranks and calculated Spearman's rank correlation coefficient to assess the temporal stability of the measures. These data are shown in Table 3.

As can be seen from Table 3, all reading variables have shown temporal stability over time with word reading being the most stable reading variable.

Lastly, we wanted to evaluate the models predicting word list reading and pseudoword list reading in Grade 5 from phoneme deletion task, RAN_letters, and RAN_objects in Grade 3. The stepwise multiple regression model (backward) for word list reading is presented in Table 4, and the model for pseudoword reading is presented in Table 5. We did not present data for statistically non-significant predictors.

As can be seen from Table 4, statistically significant predictors of reading words at Grade 5 were the RAN_objects and RAN_letters tasks, and the excluded variable was the Phoneme deletion task.

Statistically significant predictors of pseudoword reading at Grade 5 were RAN_objects and phoneme deletion tasks. RAN_letters was not a statistically significant predictor of pseudoword reading.

Discussion

The present paper aimed to examine the developmental trends of decoding abilities in the

Table 3

Spearman's rank correlation between the reading variables at two time-points

Reading Variables		Spearman's Correlation
Word reading Grade 3	Word reading Grade 5	.90
Pseudoword reading Grade 3	Pseudoword reading Grade 5	.76
Phoneme deletion Grade 3	Phoneme deletion Grade 5	.67
RAN_letters Grade 3	RAN_letters Grade 5	.65
RAN_objects Grade 3	RAN_objects Grade 5	.71

Note. all p's < .01.

Table 4

A stepwise multiple regression predicting word list reading at Grade 5 from Phoneme deletion task, RAN_letters and RAN_objects at Grade 3

Predictors at Grade 3	B	SEB	β	t	p
Intercept	128.67	10.57	-	12.17	<.001
RAN_objects	-.95	.22	-.56	-4.3	.001
RAN_letters	-.67	.31	-.29	-2.2	.04

Note. R2 = .55 (unadjusted), R2 = .52 (adjusted).

Table 5

A stepwise multiple regression predicting pseudoword list reading at Grade 5 from Phoneme deletion task, RAN_letters and RAN_objects at Grade 3

Predictors at Grade 3	B	SEB	β	t	p
Intercept	67.05	6.08	-	11.02	<.001
RAN_objects	-.39	.13	-.44	-3.1	.001
Phoneme_deletion	-.12	.05	-.33	-2.3	.03

Note. R^2 = .42 (unadjusted), R^2 = .37 (adjusted).

Bosnian language from Grade 3, a phase of alphabetic readers, to Grade 5, a phase of intermediate readers. This study showed a large improvement in decoding skills from Grade 3 to Grade 5, for both, word reading and pseudoword reading. We also found a large improvement in RAN tasks and in phoneme deletion task. These findings indicate significant improvements in decoding skills happen between 3rd and 5th Grades. In addition to these findings, we have also found great temporal stability in word reading from Grade 3 to Grade 5. Children who were good readers in Grade 3, were also good readers in Grade 5. In the same line, children who were poor readers in Grade 3 were also poor readers in Grade 5.

However, the question remains when this developmental trajectory in decoding abilities reaches its plateau. Previous studies in the English language have reported that the growth trajectory in oral reading fluency sharply increases from Grade 3 to Grade 5 and only a slight increase from Grade 5 to Grade 6 [35]. We have also found the same trend from Grade 3 to Grade 5 in the Bosnian language. However, the increase from Grade 5 to higher grades has yet to be examined in the Bosnian language. The findings of our study suggest that decoding skills in Grade 3 children can accurately tell us how these children will decode in Grade 5. This is very important information from the interventionist perspective so that struggling readers can be identified earlier and be provided with adequate educational support.

As for the predictors of word reading skills at Grade 5, we found that RAN of objects and letters were both significant predictors and explained 52% of the variance in the word reading scores. RAN tasks measure automaticity, a skill necessary for successful reading [30]. It appears that different RAN tasks have a different impact on reading. Our study has shown that RAN of objects had a stronger effect on reading than RAN of letters. This is in line with Meyer, Wood [30] study that showed RAN of colors and objects were better predictors of reading than RAN of numbers and letters. On the other hand, some studies showed a greater effect of alphanumeric RAN tasks than non-alphanumeric RAN task on future reading [26].

Phoneme deletion task and RAN of objects significantly affected pseudoword reading. These two predictors explained 37% of the variance in pseudoword reading task. Phoneme deletion belongs to complex phonological skills related to reading [4]. Although in this study it was not a significant predictor of word reading, other studies conducted in the Bosnian language have found phoneme deletion task to be the most important predictor of reading speed [27].

It is interesting to note a significant improvement in both word reading and pseudoword reading from Grade 3 to Grade 5. In this study, the growth of pseudoword reading was slightly larger than that of word reading. An earlier study by Caravolas [5] reported reverse findings for the Czech and Slovak languages, where the growth was larger for word than pseudoword reading efficiency. However, it is important to note that children in that study were younger (Grades 1 and 2) than the children in our study. Another finding in this study was the high correlation between word reading and pseudoword reading at both times. In Grade 3, the correlation was slightly higher between word reading and pseudoword ($r = .87$) reading than in Grade 5 ($r = .79$). This finding is similar to findings of van Setten, Hakvoort [45], in which the authors found a strong association between reading fluency in Grade 3 and reading in Grade 6.

This study pointed to the large improvements in reading variables in children aged 8 to 10 years, and it also showed the importance of PA and RAN as predictors of reading. As demonstrated by previous studies, it seems that models of early literacy development are very similar across different languages and orthographies [2; 12].

It is worth mentioning that the reading predictors we used in this study are susceptible to training. This is especially relevant as the research suggests that decoding skills should be one of the main targets in intervening with poor readers [25]. RAN can be significantly enhanced with training [49]. Similarly, computerized remedial training has shown great potential in improving phonological awareness [33]. Children at risk of phonological difficulties can greatly benefit from teacher-delivered school-based interventions [16]. Timely intervention in these domains can have a positive impact on reading.

This study is not without limitations. The first limitation is the small sample size. We assessed

reading variables for only 36 students from the original sample at Grade 5, which significantly limits the generalizability of our results. Due to the small sample, the obtained results may be sample-specific. Thus the study needs to be replicated in different samples with a larger number of participants. We also did not consider some cognitive variables, such as working memory, that impact reading skills [24]. The inclusion of variables such as working memory, processing speed, and vocabulary might have created an even better model of decoding skills. Another limitation of this study is the situation with the COVID-19 pandemic, as the children were attending some portions of their education online. It is hard to tell whether this form of schooling influenced children's reading development.

Conclusion

Word reading and pseudoword reading improved significantly from Grade 3 to Grade 5. On the one hand, RAN of objects and letters were significant predictors of word reading skills and explained 52% of the variance in word reading skills. On the other hand, RAN of objects and phoneme deletion task were significant predictors of pseudoword reading and explained 37% of the variance in pseudoword reading skills. Given that decoding abilities seem to be stable across time, it would be beneficial to assess reading abilities and reading predictors as early as possible in order to identify children at risk of reading difficulties. Understanding reading development from Grade 3 to Grade 5 can help create timely programs of reading instruction for all readers.

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Получена 20.06.2022
Принята в печать 24.08.2022

Received 20.06.2022
Accepted 24.08.2022

Психологическая наука и образование
2022. Т. 27. № 5. С. 107—120
DOI: https://doi.org/10.17759/pse.2022270509
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
2022. Vol. 27, no. 5, pp. 107—120
DOI: https://doi.org/10.17759/pse.2022270509
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Reading Skills of First Graders in Russia and Kazakhstan: a Cross-Cultural Study

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This article assesses the intercultural comparability of reading assessment results taking into account the specifics of the test content in relation to the child's cultural environment. The reading skills of first graders in two countries were assessed using the reading scale of the computerized instrument "Start". The sample of students from Kazakhstan included 1102 first-graders from Russian-language schools in the city of Almaty. The sample of students from Russia included 2247 first-graders from the city of Novosibirsk. Pearson reliability and Chronbach's alpha were in the range from 0.89 to 0.96. Subsequently, Differential Item Functioning analysis was carried out on a combined sample in order to investigate whether the scale tasks work identically for the students from Russia and Kazakhstan when the levels of their reading skills are taken into consideration. Logic regression showed that there are no items with DIF effect size reaching beyond 0.13 (under Zumbo-Thomas classification). The research outcomes may be of interest to international comparative studies of reading skills development.

Keywords**:** international comparative studies, early reading skills, intercultural comparability, primary school, adaptation.

For citation: Ivanova A., Antipkina I., Abisheva S., Abayeva M. Reading skills of first graders in Russia and Kazakhstan: a Cross-Cultural Study. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2022. Vol. 27, no. 5, pp. 107—120. DOI: https://doi.org/10.17759/pse.2022270509 (In Russ.).

Навыки чтения первоклассников в России и Казахстане: кросс-культурное исследование

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Представлены материалы исследования межкультурной сопоставимости заданий теста по чтению и культурной среды ребенка. Оценивание навыков чтения первоклассников в двух странах происходило с использованием шкалы чтения компьютеризированного инструмента «Старт». Выборка учащихся из Казахстана представлена первоклассниками из русскоязычных школ города Алматы, N=1102 ребенка. Выборка учащихся из России представлена первоклассниками города Новосибирска, N=2247 учеников. Авторы показали, что задания теста навыков чтения в целом функционируют одинаково для первоклассников из билингвальной среды Казахстана и первоклассников города Новосибирска. Психометрический анализ данных обеих версий был проведен отдельно для каждой национальной выборки. Показатели классической и Раш-надежности для версий двух стран варьировали от 0,89 до 0,96. Затем на объединенной выборке был проведен DIF-анализ с целью выяснить, работают ли задания инструмента одинаковым образом для учащихся из России и Казахстана при учете их уровня подготовленности по чтению. Использованный метод логистической регрессии показал, что в тесте нет заданий с различием функционирования типа B или C (в которых размер эффекта превышал бы показатель 0,13 в классификации Зумбо-Томас). Результаты представляют интерес для международных сопоставительных исследований развития навыков чтения.

***Ключевые слова*:** международные сравнительные исследования, ранние навыки чтения, межкультурная сопоставимость, начальная школа, адаптация.

Для цитаты: *Иванова А.Е., Антипкина И.В., Абишева С.Д., Абаева М.К.* Навыки чтения первоклассников в России и Казахстане: кросс-культурное исследование // Психологическая наука и образование. 2022. Том 27. № 5. С. 107—120. DOI: https://doi.org/10.17759/pse.2022270509

Introduction

Reading is the main technology of cognition [1], so reading research is crucial for education systems. Bilingualism in the education system of Kazakhstan raises a number of questions about the comparability of student learning outcomes. This study will focus on the entry-level reading assessment test for the first-graders and its functioning in two cultures: Russian-language schools in Almaty (Kazakhstan) and Russian-language schools in Novosibirsk (Russia).

Previous large-scale studies of the reading skills of Kazakhstani schoolchildren were carried out in the framework of international comparative studies. For the first time, Kazakhstan participated in the Progress in the International Reading Literacy Study in Primary Schools (PIRLS) in 2016, with assessments conducted in Russian and Kazakh languages on the sample of 2,983 students with the Kazakh language of instruction and 1,942 students with the Russian language of instruction. PIRLS is an independent international study of the reading literacy of the 4th grade students, which is conducted by the International Association for the Evaluation of Educational Achievement (IEA) [2; 3; 4]. According to the results of PIRLS-2016, the fourth-graders of Kazakhstan took the 27th place in the ranking of 50 countries (for comparison, Russian students took the first place in the PIRLS-2016 ranking), girls showed higher results than boys (the same trend as in 48 out of 50 other participating countries), children worked better with information than with literary texts [5]. Based on the results of the PIRLS-2016 study, it was concluded that "Kazakhstani children receive insufficient experience in reading literary texts" [6]. In the Program for International Student Assessment (PISA)-2018, students in Kazakhstan scored an average of 387 in reading literacy, below the OECD average of 487 [7; 8].

International studies of reading skills PIRLS and PISA have raised interest to reading studies in Kazakhstan [9]. In recent years, the country has paid considerable attention to the issues of children's reading [10; 11]. 2019 was declared the National Year of Reading in the country, in 2020 the project "Reading School — Reading Nation" was launched, 2021 became a year of children's reading support in Kazakhstan.

Within the framework of the state program of multilingualism, the Russian language, like Kazakh and English, is mandatory in school curricula for the entire period of study (grades 1—11), regardless of the language of instruction. Of the 5,807 schools in the republic, 1,885 are schools with Russian as the language of instruction. 2,147 out of the total number of schools are mixed language schools. In order to obtain objective data and be able to compare schools with two language bases, it was decided to monitor the formation of reading skills in two stages.

• Stage 1: using the START tool to study the reading skills of students in the 1st grade of schools with the Russian language of instruction in Almaty. Today, only the information about reading skills of the fourth-graders (PIRLS) and fifteen-year-old students (PISA) available in Kazakhstan only.

• Stage 2: develop the Kazakh version of the START / BASTAU test and assess reading skills among students of primary schools with the Kazakh language of instruction.

This article presents the results of the first stage of the study. To assess first-graders, we used the reading scale from the START instrument [12], which was developed on the basis of a localized Russian version of the British iPIPS tool [13; 14], which is also used in Australia, Brazil, Germany, South Africa [15; 16; 17; 18].

In order to use the Russian-language instrument in schools with the Russian language of instruction in Kazakhstan, it is necessary to prove that in the bilingual culture of Kazakhstan, all items of the Russian-language scale function the same way as for the Russian-speaking students of Russian schools.

Literature review: world experience in research on the comparability of assessment tools

The cultural environment can have a significant impact on assessment results that are standardized on other groups [19]. Culture is defined as "learned meanings and patterns of behavior shared by members of a group, which are transmitted through social activity for the purpose of social adaptation, growth and development" [20]. In ability tests, not a single aspect of assessment is free from cultural effects: the content of the test, stimulus materials, construction of phrases, content of instructions, behavior of participants during testing and experts when assigning scores (if needed) [21]. Thus, any test contains cultural specificity. Finding out whether this specificity is an obstacle to the fair assessment of people from different cultural groups is the goal of equivalence studies.

A number of examples shows the lack of comparability of results for individual countries and constructs in major international studies [22; 23; 24; 25]. Even if countries use the same language and the test does not need to be translated, this does not eliminate the risks of cultural differences in assessment results [26]. For example, the English version of the iPIPS tool has been adapted for use in Australia despite the common language (English), because DIF analysis demonstrated functioning of some items not in favor of students from the Aboriginal Australian group [18]. Within the framework of the same international iPIPS project (underlying the Start), studies were carried out on the comparability of the Russian and English versions of the instrument for the mathematical part of the test [25], in which differences in the functioning of several items were revealed, due to which these items were excluded from secondary analyses.

Cross-cultural equivalence of measurements is investigated at three levels [27]:

- construct level (what is being measured),
- the level of a measurement instrument (how is being measured)
- and the level of a measurement scale (in what units it is measured).

In our study, for two cultures — Russia and Kazakhstan — the same Russian-language instrument and the same psychometric analysis procedures were used, so the construct and scale levels are expected to be identical; this allows comparability analysis to be focused on the instrument level.

There are three possible sources of intercultural bias in the assessment results [28]:

1) Sample differences. For example, samples may be not comparable if countries have different rules for disability inclusion at schools.

2) Test differences. For example, in item wordings, realities that are well known in one culture, can be exotic for another country.

3) Differences in data collection procedures. A classic example of such procedural violations was the testing of children from Nigeria with Rowan's matrices "on the thresholds of houses, in hallways, under trees" with the help of untrained staff, which was very different from the conditions in which children were assessed in European countries [29].

In our study, the conditions for data collection were standardized by a single computer environment, voiceover of the instrument by a professional speaker (interviewers were not required to read instructions), and the same training procedures for interviewers. The samples of children were comparable in age (6-7 years old) and status (just started schooling). Thus, the goal of this study was to use statistical methods to assess the threats to intercultural comparability of assessment results due to the content of test items.

Materials and Methods

Assessment instrument. "Start" is a computerized reading assessment tool with a semi-adaptive task presentation algorithm [12; 30], so if a child makes a certain number of mistakes, the assessment stops so as not to demotivate the child. The assessment involves individual sessions of a child with a specially trained interviewer. The reading scale includes 35 tasks and covers the following areas:

* Letter recognition. Russian letters are presented one by one on the screen, the voice of the actor asks the child to name the letter. The correct answer is the name of the letter in the official and colloquial form (for example, “em” and “m” would be the correct answers for “M”) or the sound (“m-m”). The wrong answer is the name of the object with this letter (for example, if the child says “Meat” for “M”).

* Reading individual words

* Reading a short story (“mechanical” reading)

* Reading comprehension test. In this part of the instrument, the child reads the text, in some places of which he or she is asked to choose one of the three words that is most appropriate for the context.

The Start tool is standardized using the dichotomous Rasch model [12; 14].

Sample. The reading skills of the first graders were assessed by the Start tool in October 2019, when the children had just started school. The sample of Russian-language schools in the city of Almaty consisted of 1102 children. The sample is not representative. The sample of the first-graders in Novosibirsk consisted of 2247 students. Novosibirsk was chosen as a region with comparable geographical location, industrial development and population compared to Almaty. The sample of students in Novosibirsk was randomized and stratified by the type of school and city district.

Analysis. The comparability study of the instrument in two cultural environments (Russia and Kazakhstan) was carried out in two stages.

At the first stage, a psychometric analysis of the instrument was carried out on a sample of Russian-speaking schools in Almaty and Novosibirsk separately. The test was analyzed under the dichotomous Rasch model [31]. The model is used for dichotomous items with one correct and one incorrect answer. To assess the reliability of the scales, Cronbach’s alpha and Rasch Person reliability (Separation Reliability) are used. Cronbach’s alpha is a measure of internal consistency and captures the interrelation of the scale items [32]. Person reliability shows the reproducibility of the hierarchy of measures [33].

At the second stage, differential item functioning analysis was carried out. Differential item functioning (DIF) reveals cases when students with the same level of preparedness have different chances to complete an item correctly [34; 35]. The presence of DIF implies that an item functions in favor of one of the groups of students, despite the fact that these students have the same ability/final score. Different cultural backgrounds can be a source of differential item functioning, even if the development of the tool followed all necessary procedures in accordance with international standards [23; 36; 37].

DIF analysis contributes to the correct interpretation of the assessment results and helps to refine the tool so that it becomes fairer to all groups of students.

Results

Psychometric analysis of the data from both versions was conducted first separately for each national sample, and then on a combined sample to find out if the instrument items work in the same way for students from Russia and Kazakhstan, taking into account their level of reading proficiency.

Table 1 shows the characteristics of items for each of the two samples separately. Characteristics include task difficulty measures (columns 1, 2), fit statistics (columns 3, 4). Item codes are presented in column 5. The goodness of fit statistics are the standardized residuals which are based on estimates of response probabilities for each item. In this table we use one fit statistic — weighted goodness of fit (Infit MNSQ) statistic. As can be seen from the table, the mean values of the goodness-of-fit statistics lie within the range recommended by psychometricians [0.6; 1.4] for all items, except for the first two (letter knowledge) for the Novosibirsk sample [33]. The measurement error is somewhat higher for tasks for a sample of children from Kazakhstan. The correlation of the response to the task with the level of preparedness is high and positive.

Table 1

Item characteristics for a sample of students from Novosibirsk, Russia and Almaty, Kazakhstan

Difficulty measures (logits)		MNSQ Infit		Item
Rus	Kaz	Rus	Kaz	
-1.37	-1.92	1.53	1.25	Letter «K»
-1.37	-1.65	1.45	1.36	Letter «L»
-1.02	-1.35	1.13	1.22	Letter «e»
-1.15	-1.43	1.24	1.23	Letter «Zh»
-1.36	-.95	1.15	1.32	Letter «Z»
-.33	-.89	1.36	1.26	Letter «Sh»
-.37	-.31	1.11	1.16	Letter «Ts»
-.71	-.60	1.06	1.21	Letter «Yu»
-.05	-.09	1.25	1.24	Sign «’»
-2.44	-2.24	.92	1.05	Word «myach»
-3.15	-3.11	1.06	1.27	Word «utka»
-2.82	-3.38	.90	.95	Word «shchenok»
-2.66	-2.75	.80	.93	Word «ruka»
-2.99	-3.26	.81	.81	Word «dom»
-1.20	-.63	1.00	1.17	Word «kon»
-1.10	-.77	.95	1.00	Word «korabl»
-1.82	-1.65	.81	.86	Word «kot»
-.99	-.81	.93	.94	Word «krolik»
.22	-.02	.76	.54	Reading decoding 1
.32	.05	.76	.52	Reading decoding 2
.47	.13	.77	.52	Reading decoding 3
1.22	1.57	.87	.96	Comprehension 1
1.06	1.41	.74	.88	Comprehension 2
1.20	1.35	.71	.82	Comprehension 3
1.24	1.39	.76	.87	Comprehension 4
1.75	2.16	.90	1.01	Comprehension 5
1.76	2.00	.92	1.00	Comprehension 6
.94	.74	.62	.67	Comprehension 7
2 .29	2.08	1.09	1.03	Comprehension 8
1 .95	2.01	1.00	.97	Comprehension 9
2 .50	2.44	1.03	1.00	Comprehension 10
3 .40	3.36	1.16	1.15	Comprehension 11
1 .73	1.59	.91	.93	Comprehension 12
2 .95	3.33	1.24	1.18	Comprehension 13
1.91	2.16	.93	.94	Comprehension 14

Rasch modelling allows visualizing the characteristics of the items and respondents using the so-called “variable maps” (or “Wright maps”). In Figures 1 and 2, the vertical line represents the continuum of reading skills measured in logits. The easiest items and the least prepared students are at the bottom of the continuum, while the most difficult items and the most prepared students are at the top.

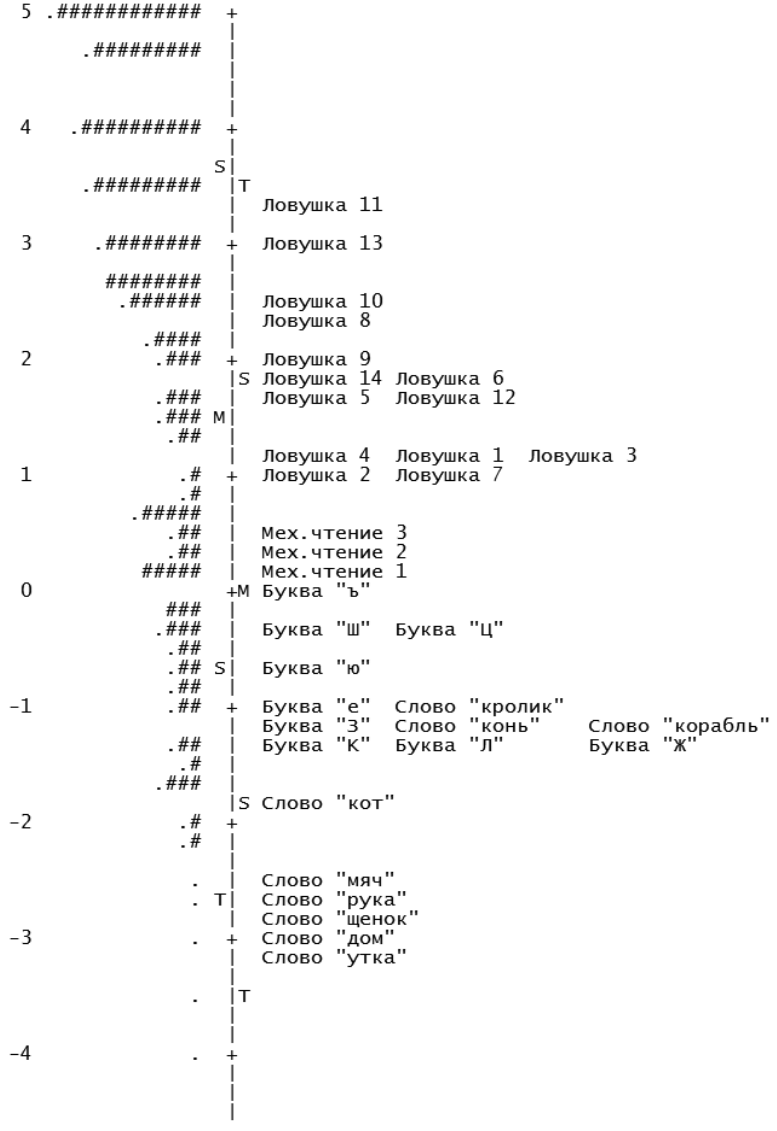

Figure 1. Item and Person map. Russia

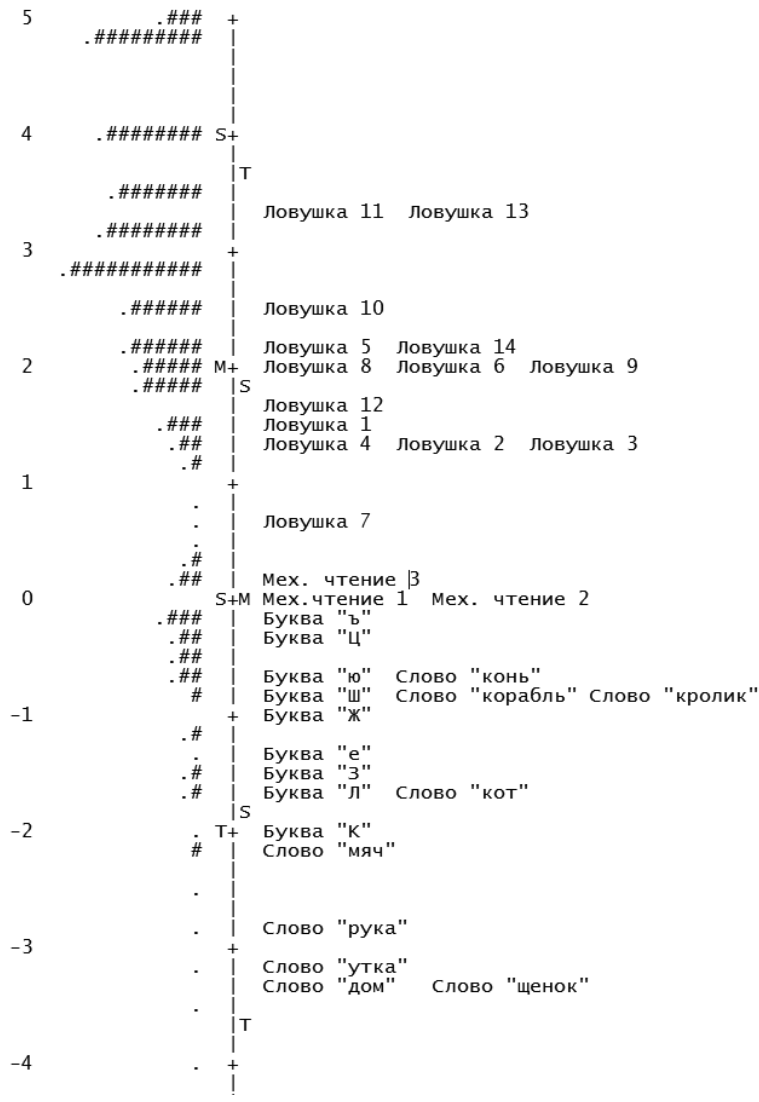

Figure 2. Item and Person map. Kazakhstan

It can be seen that both samples are characterized by a shift towards high scores for most of the children, i.e. for most students, the test was easy enough. We can also note that, in general, the hierarchy of items in terms of difficulty for the two samples is almost identical.

Table 2 presents the overall psychometric indicators of the reliability of reading scales for empirical data obtained from samples of students in Russia and Kazakhstan.

Both versions of the Start are characterized by high levels of reliability: Cronbach's

Table 2

Reliability of the scales

	Chronbach's alpha	Person Reliability	Person Separation
Russia	0.96	0.91	3.17
Kazakhstan	0.94	0.89	2.89

alpha and Person Reliability are over 0.8 which stands for 'excellent' reliability; Person Separation makes it possible to distinguish at least three groups of students according to their level of reading skill.

The good psychometric qualities of the reading scale separately on samples of students from Russia and Kazakhstan make it possible to build a single scale of test results for the first-graders from the two countries, and conduct DIF-analysis.

Within the framework of this study, DIF analysis was carried out using the logistic regression method. The method of logistic regression [35; 38] allows to detect both homogeneous (when the statistical relationship between the response to the item and the grouping variable is constant for all levels of the corresponding variable), and heterogeneous DIF (when the statistical relationship between the response to the item and the grouping variable changes for different levels of sum of scores). The method implies the statistical modeling of the probability of correctly answering the item, depending on the sequentially introduced variables: 1) the grouping variable "country" (in our case), 2) the sum of test scores, and 3) the interaction between the first and second variables. In this work, the R software, the DIFR statistical package, was used to analyze DIF [39]. The statistical significance of the model parameters was assessed using the LR test (Likelihood Ratio Test).

In the logistic regression method, an item is identified as showing a certain type of DIF when the sequential addition of a country variable and an interaction variable gives a significant improvement in the model compared to a model that includes only a variable with the sum of scores [34].

It is important to note that differences between groups of subjects may be statistically significant, but too small to have any effect on the results of the assessment. Therefore, researchers are encouraged to use a combination of indicators: the statistical significance of DIF and practical significance (or effect size) in order to make an informed decision about what to do if differential item functioning is identified.

In this paper, we use a combination of the Likelihood Ratio Test statistic significance and DIF effect size, presented in two versions — Zumbo-Thomas and Jodoin-Girl [39]. For an item to be classified as exhibiting DIF, the LR test criterion must be less than or equal to 0.01, and the effect size must be large enough. According to the Zumbo-Thomas criterion, DIF can be classified as follows: negligible type "A" DIF (change in R-squared values of two nested models is below 0.13), moderate type "B" DIF (change in R-squared values of two nested models is from 0.13 to 0.26) and a large Type "C" DIF (change in R-squared values of two nested models is above 0.26). According to a more stringent Jodoin and Girl DIF criteria, DIF can be classified as negligible type "A" DIF (change in the R-squared values of the two nested models is below 0.035), moderate type "B" DIF (change in the R-square values of the two nested models is from 0.035 to 0.07), and a large type "C" DIF (change in R-squared values of two nested models is above 0.07). Table 3 shows the results of DIF analysis using the logistic regression method.

The analysis showed that despite the statistical significance of the LR-test for a

Table 3

Differential item functioning analysis using logistic regression model

Item	LR-test	P-value	R^2	DIF size (Zumbo-Thomas)	DIF size (Jodoin -Girl)
Letter «K»	24.36	0.00 ***	0.01	A	A
Letter «L»	7.91	0.02 *	0.00	A	A
Letter «e»	7.14	0.03 *	0.00	A	A
Letter «Z»	6.78	0.03 *	0.00	A	A
Letter «Sh»	22.19	0.00***	0.00	A	A
Word «myach»	14.57	0.01 ***	0.00	A	A
Word «utka»	11.75	0.00 **	0.01	A	A
Word «shchenok»	7.71	0.02 *	0.00	A	A
Word «kon»	18.64	0.00 ***	0.00	A	A
Word «korabl»	6.99	0.03*	0.00	A	A
Reading decoding 1	24.56	0.00 ***	0.00	A	A
Reading decoding 2	29.62	0.00***	0.00	A	A
Reading decoding 3	35.69	0.00 ***	0.00	A	A
Comprehension 1	17.62	0.00 ***	0.00	A	A
Comprehension 2	26.22	0.00 ***	0.00	A	A
Comprehension 3	9.85	0.01 **	0.00	A	A
Comprehension 4	8.82	0.01 *	0.00	A	A
Comprehension 5	24.47	0.00 ***	0.00	A	A
Comprehension 6	9.26	0.01 **	0.00	A	A
Comprehension 13	18.33	0.00 ***	0.00	A	A
Comprehension 14	10.32	0.01 **	0.00	A	A

Note: *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$

number of reading items, the size of the DIF effect is so small that it can be neglected for the practical use of the results. In other words, for students from Russia and Kazakhstan, all items of the reading test work rather the same way.

The results of any study that includes cross-cultural assessment can be correctly compared if similar scores of test participants in two countries mean a similar level of proficiency [40; 41]. This study focused on the first-graders' reading assessment tool and its functioning in two cultures: Russian-language schools in the city of Almaty (Kazakhstan) and Russian schools in the city of Novosibirsk (Russia). Our psychometric analysis showed that the tool for assessing early reading skills at the start of school functions well not only among Russian-speaking children in Russia, but also among Russian-speaking children in Kazakhstan. The scale shows similar measures for samples of children in the two countries, including model fit, reliability scores, distribution of item difficulty, and student achievement levels.

Ensuring the psychometric quality of assessment tools is a priority for the evi-

dence-based decisions in education [42]. We have shown that the cultural effect does not interfere with the difficulty of first grade reading test items in two countries. This opens up prospects for international research in Kazakhstan, with the help of Russian-language tools already standardized on Russian samples.

At the same time, it is important to note that Russian and Kazakhstani children in an equally successful way coped with most of the reading test items. The question arises: if at the start of school children from Russia and Kazakhstan have comparable reading skills in Russian, why by the end of the fourth grade there is a gap in skills demonstrated in PIRLS? A longitudinal study in Russian-language primary schools in Kazakhstan using instruments with proven psychometric properties may help answer this question.

In the future, it is planned to adapt the START tool to the Kazakh language in order to conduct a comparative study of the educational achievements of schoolchildren from schools with Russian and Kazakh as the language of instruction.

The co-authors declare no conflict of interest in the present study.

It seems that part of Conclusion / Discussion is missing. Normally, it follows the part Results and summarizes the results you got in the study. So, please arrange it accordingly.

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Получена 11.04.2022 Received 11.04.2022
Принята в печать 30.08.2022 Accepted 30.08.2022