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Meaning-in-Life Orientations and Characteristics of Communication and Motivation of Students Studying at Gifted Education Centers

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Abstract

Introduction. This paper is the first to examine the psychological characteristics of students studying at gifted education centers of various types – basic and supplementary education. The aim of the study is to analyze the relationship between meaning-in-life orientations and academic motivation and communicative characteristics of students studying at gifted education centers and secondary schools. **Methods.** The study population comprised 280 students of the Specialized Educational Scientific Center of the Southern Federal District (SESC SFD) (n = 54), the Sirius Educational Center (n = 75) and secondary schools in Rostov-on-Don (n = 150) aged from 12 to 18 years (mean age = 15.3 years), of whom 157 were females and 123 were males. The psychological testing method was used. The diagnostic tools included the Meaning-in-Life Orientations test (MLO) by D. A. Leont'ev (Leont'ev, 2003), the test of the Structure of Schoolchildren's Educational Motivation by M. V. Matyukhina (Matyukhina, 1984), and the test of Self-Regulation and Success of Interpersonal Communication by V. N. Kunitsyna (Kunitsyna, Kazarinova, Pogol'sha, 2001). Data processing was performed using mathematical statistics using the R 4.1.3 programming language. **Results**. Compared to school students, 21% of whom have a high level of meaningfulness of life, students studying at gifted education centers, 40% of whom have a high level of meaningfulness of life, have higher rates of academic motivation. Significant differences were found in cognitive motivation, achievement motivation, motivation for self-development and a student's position in the groups of students with low and high rates of meaningfulness of life. Meaning-in-life orientations

were positively related to characteristics that facilitate communication and negatively related to characteristics that complicate communication. Studying in Sirius significantly increases the likelihood that students achieve a high level of success in life. **Discussion.** Compared to secondary school students, those studying at gifted education centers have a higher level of meaningfulness of life. Communication characteristics depend more on the level of meaningfulness of life than on the type of educational institution. Based on the research results, methodological recommendations were developed for teachers and psychologists who work at gifted education centers using the SESC and Sirius models.

Keywords

meaning-in-life orientations, communicative characteristics, academic motivation, regression analysis, gifted students, education centers, comprehensive schools

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Introduction

Talented and gifted people are a powerful resource for social development. Modern society needs creative, active, intelligent citizens who know their strengths and growth points, know what they want to learn and what they will do in the future. The existing system of school education process makes it difficult for teachers to meet the growing needs of such students.

Today, there are different approaches to teaching high ability children: acceleration, deepening, enrichment, and problematization of education (Yakovlev, Gafarova & Klimovich, 2015; Baccassino & Pinnelli, 2022; Smith, 2021). At the same time, it is the enrichment and problematization of education that is considered the most promising. They focus on changing the content of the curriculum towards broadening views, going beyond standard topics, and using original explanations of problems. Approaches to teaching high ability children are implemented in various forms of educational organization, among which collaborative learning stands out. *Collaborative learning*

is a system of comprehensive schools, in which special conditions are created for the differentiation of children's education and separate special classes. Moreover, *long-term training* is possible, which involves complete immersion in the educational environment at the stage of preparation for passing state exams in institutions attached to universities or specialized centers, so that students can more accurately choose their educational path. Short-term programs with a high level of preparation and in-depth study of subjects provided by institutions of additional education are also used (Shumakova, 2020; Lewis & Boswell, 2020; VanTassel-Baska, 2021).

Specialized centers for general and additional education of gifted children, operated independently and in universities, are becoming increasingly popular among teachers and parents (Shmeleva, 2018). As of February 20, 2024, 17.009 "Growth Point" educational centers for students of general education organizations in rural and small towns, 280 "Quantorium" technology parks for children (including 145 technical parks based on general education organizations), 261 "IT-cube" digital education centers, 30 key centers for additional education of children, 85 "Quantorium" mobile technology parks have been established and operate in Russia. In 76 constituent entities of the Russian Federation, regional centers are established to identify, support, and develop the talents and abilities of children and young people ("Mini-Sirius") ("Education" National Project, 2024). Among such centers, the most prominent are the Sirius Educational Center of the Talent and Success Foundation in Sochi (hereinafter referred to as Sirius), as well as the Specialized Educational and Scientific Centers (hereinafter referred to as SESC). In 2020, the SESC SFD was established in the Southern Federal District (SFD) at the Southern Federal University. Although schools actively introduce project and research activities aimed at developing students' research, presentation and evaluation skills, this is not enough to meet the interests of motivated students. In addition to improving cognitive abilities, it is also necessary to support life strategies, motivation, strengthening responsibility, communication skills, cooperation, critical thinking and error analysis.

Selection for supplementary and gifted education centers is based on an assessment of student portfolios and subject and psychological tests. Particular attention is paid to such a criterion for student selection as "...effective participation in All-Russian Olympiads and competitions, various kinds of regional and international competitions" (Shmeleva, 2018, p. 34). Olympiads and competitions enable students not only to fill their lives with academic activities, but also to participate in active extracurricular activities, and also to receive certificates that fill out their portfolio. On the other hand, it is difficult for students to define clearly the purpose of their participation when school conferences and competitions become common. As a rule, teachers can ask children to compete with students from other schools or regions to improve the status of the school. In this case, however, such events will be of little interest to students themselves. Motivation for high achievement may disappear, routine may contribute to a loss of the meaning of demonstrating extraordinary knowledge and abilities, and learning alienation may occur (Abakumova, Mironenkova & Pen'kov, 2019).

For modern gifted children and adolescents, in order to maintain and improve educational motivation, the usual warnings from teachers about lack of success in the future or low-paid work without education are no longer sufficient. They have already achieved a lot for their age, and now teachers need not only to stimulate interest in learning, but also to address their meaning-in-life orientations.

Meaning-in-life orientations represent an organized structure of meaningful views, life goals, assessments, and meaningful choices that reflect the individual's direction and ensure satisfaction and integrality of life activities (Leont'ev, 2003). Meaning-in-life orientations are an important indicator of the individual's values and orientation. This is a unique criterion for students with high educational needs, enabling them to come together in learning and knowledge acquisition.

The authors do not claim that respondents in this study are gifted. In this work, 'gifted' means students of the South Federal District Specialized Educational and Research Center and the Sirius Educational Center. These institutions are aimed at early identification, education and support for talented children and talented young people who have demonstrated exceptional abilities. These centers are created not only for professional training and advanced educational opportunities for children, but also for the formation of a global system for selecting and promoting the best psychological and educational solutions, technologies and practices that contribute to the achievement of this objective (Charter of Talent and Success Educational Foundation, 2021).

Research into the psychological, social, and emotional characteristics of secondary school students is a global trend in the field of maintaining and developing giftedness (Dikaya, Dikiy & Pokul', 2019). Psychologists and teachers study the relationship between high intellectual abilities and creativity and the psychological characteristics of adolescents.

Academic motivation, communication skills, and meaning-in-life orientations are predictive of academic success and future professional development. The meaning-in-life orientations of intellectually gifted students are considered to be a component of individual value-meaning sphere (Fedoseeva & Mineeva, 2020; Speshilova, 2011). The characteristics of talented students in the communication sphere (Grushetskaya & Shcherbinina, 2018) and academic motivation are studied as predictors of academic achievements (Abraamyan, 2019; Akovantseva, 2016; Makhina, 2018). Foreign researchers studied the motivational components of educational activities (Johnson, Irizarry, Nguyen & Maloney, 2018), considered the relationship of academic motivation with persistence and such concepts as 'grit', which has been studied as the diligence and perseverance of individuals in achieving goals or in defending views (Duckworth, Peterson, Matthews & Kelly, 2007; Steenbergen-Hu, Olszewski-Kubilius, & Calvert, 2020), with emotional intelligence (Casino-García, Llopis-Bueno & Llinares-Insa, 2021), with burnout among schoolchildren (Usán Supervía, Salavera Bordás & Murillo Lorente, 2020).

The high school age is considered sensitive to the formation of the individual's meaning-related sphere and meaning-in-life orientations. Many scientists regard this issue as both a relationship between student motivational structures and important life orientations (Alkanova, 2017; Martyushev, 2020; Paskar, 2021) and as a particular factor in academic motivation and value-meaning aspects of adolescents' lives (Klepach & Rubtsova, 2019; Badmaeva & Matyukhina, 2004).

Research on students with high educational needs shows that it is necessary to improve students' communication skills (Zinchenko, 2018). According to a study on student adaptation conducted at the Scientific Research Centre in the Southern Federal District, 20.6% of students reported difficulties in communicating with teachers (Zinchenko & Semina, 2020). Personal qualities that influence communication are important not only in relation to the collective structure of research activities, but also in relation to the high risks of problematizing this field.

The employees of the Foundation for Talent and Success used the Big Five and Dark Triad psychological methods to study students' socio-emotional characteristics at the Sirius Education Center (Likhanov et al., 2020). The authors state that students with weaker knowledge but high academic motivation and effort can be awarded higher grades than students with stronger knowledge but low motivation. In their research, scientists noted significant differences between students from Sirius and secondary schools on the scales of 'conscience', 'extraversion', 'openness', 'narcissism', 'general behavior', and also noted the influence of psychological characteristics on academic achievements, which determine the selection for educational centers.

Today, high academic motivation and the new form of organization of educational activities encourage not only established or aspiring scientists, but also university graduates and students, as well as high school and secondary students to conduct active research activities. In the course of their secondary education, students decide on their life plans for the near future both in general and in their professional career.

The aim of this study is therefore to investigate meaning-in-life orientations in relation to academic motivation and communication characteristics of students studying at gifted education centers.

Methods

Sample

The study population comprised 280 students of the Specialized Educational Research Center of the Southern Federal District (n = 54), Sirius Educational Center (n = 75), and secondary schools in Rostov-on-Don (n = 150) aged from 12 to 18 years (mean age = 15.3 years), of whom 56% were females and 44% were males.

Diagnostic tools

The empirical study used the method of psychological testing. We used the following diagnostic tools: (a) the Meaning-in-Life Orientations test (MLO) by D. A. Leont'ev (Leont'ev, 2003), (b) the test of the Structure of Schoolchildren's Educational Motivation by M. V. Matyukhina (Matyukhina, 1984), and (c) the test of Self-Regulation and Success of Interpersonal Communication (SSIC) by V. N. Kunitsyna (Kunitsyna, Kazarinova, Pogol'sha, 2001).

Data processing

Data processing was performed using mathematical statistics using the R 4.1.3 programming language and the integrated RStudio environment.

To test the normality of the sample, we performed the Shapiro-Wilk test and found that the sample of this study is not normal, $W = 0.97$, p-value ≤ 0.05. Therefore, non-parametric methods were used for further analysis. To identify the characteristics of gifted students, a comparative analysis was carried out using the Kruskal-Wallis test. To identify reliable relationships in the motivational, communicative characteristics and meaning-in-life orientations of schoolchildren, correlation analysis using the Spearman coefficient and logistic regression analysis were used.

Results

Table 1 presents the results of a descriptive analysis of the non-standard scale of the MLO test for three subgroups of respondents divided by educational institutions. The results of other diagnostic tools are presented in Annex 1.

Table 1

Descriptive statistics of respondents' life-meaning orientations and comparative analysis, Kruskal-Wallis test

Overall sample, n = 280								
Males, n = 123				Females, n = 157				
School SESC Sirius				n = 150 n = 55 n = 75				
MLO scales	Institution	N	Mean	Sd	Median	Min	Max	H
Meaningfulness	School	150	92.32	21.69	97	8	136	17.22**
	SESC	55	104.07	21.04	104	54	152	
	Sirius	75	102.84	18.66	103	48	134	

Overall sample, n = 280								
Males, n = 123				Females, n = 157				
School SESC Sirius				n = 150 n = 55 n = 75				
MLO scales	Institution	N	Mean	Sd	Median	Min	Max	H
Life goals	School	150	27.79	7.62	28.5	8	45	19.29**
	SESC	55	33.34	9.61	35	14	66	
	Sirius	75	31.01	6.66	31	15	42	
Life process	School	150	27.57	7.57	29	7	42	11.89**
	SESC	55	31.47	10.60	32	8	80	
	Sirius	75	30.43	7.39	32	8	42	
Efficacy	School	150	22.8	6.38	23	7	35	17.12**
	SESC	55	27.84	10.65	28	13	80	
	Sirius	75	25.77	5.98	25	9	35	
Internal locus of control	School	150	19.03	5.13	20	7	32	12.13**
	SESC	55	23.05	11.65	22	12	100	
	Sirius	75	20.88	4.19	22	10	28	
External locus of control	School	150	28.08	7.27	29	7	42	19.04**
	SESC	55	32.8	8.97	33	16	75	
	Sirius	75	31.65	6.42	32	14	41	

Note: p-value ≤ 0.001 ***; 0.01 **; 0.05 *; H is the coefficient of comparative analysis, the Kruskal-Wallis test.

Because psychological diagnostic tools were evaluated at different numerical intervals, data standardization was used to simplify scales.

Following comparison analysis, we showed that the MLO test's Meaningfulness of Life score was significantly higher among students from the SESC than among students from other educational institutions ($p \leq 0.01$) (Table 1).

A comparison of academic motivation showed significantly higher results in the Cognitive Motivation, Self-Development, Student's Position and Achievement Motivation scales for gifted students compared to other students. At the same time, the Sirius students had a significantly lower communication characteristic ($p \leq 0.01$) (see Annex 1, Table 1).

Among communication characteristics, there were no significant differences between student groups in terms of expression, influence, openness, empathy, aggression, sensitivity, manipulative and authoritarian communication styles ($p \leq 0.05$) (see Annex 1, Table 2). Therefore, these scales were excluded from further analysis.

The SESC students showed, on the one hand, significantly higher results in communication ease and communication skills, and, on the other hand, the lowest results on the Shyness and Lack of Communication scales ($p \leq 0.01$).

The Sirius students had low levels of self-respect and communication ease and high scores on the Feeling of Loneliness and Alienation scales ($p \leq 0.01$). Secondary school students had high results on the Communication Skills and Shyness scales ($p \leq 0.01$). Furthermore, the group's representatives have the lowest level of confidence in the statistical trend.

Since students from secondary schools showed significant low scores in the scales of meaning-in-life orientations, and the SESC students showed high scores (Table 1), for further analysis, participants were divided according to the level of meaningfulness of life, allowing to identify the influence of personal characteristics on the meaning-related constructs of the respondents. The general Meaningfulness of Life scale was converted into binary format according to the following rule: All values greater than the average of half the standard deviation are equal to 1, otherwise equal to 0. Therefore, we could compare about 70% of respondents with a low level of meaningfulness with 30% of respondents with a high level of meaningfulness (Table 2).

Table 2

Distribution of respondents depending on the level of life-meaning orientations and educational institution

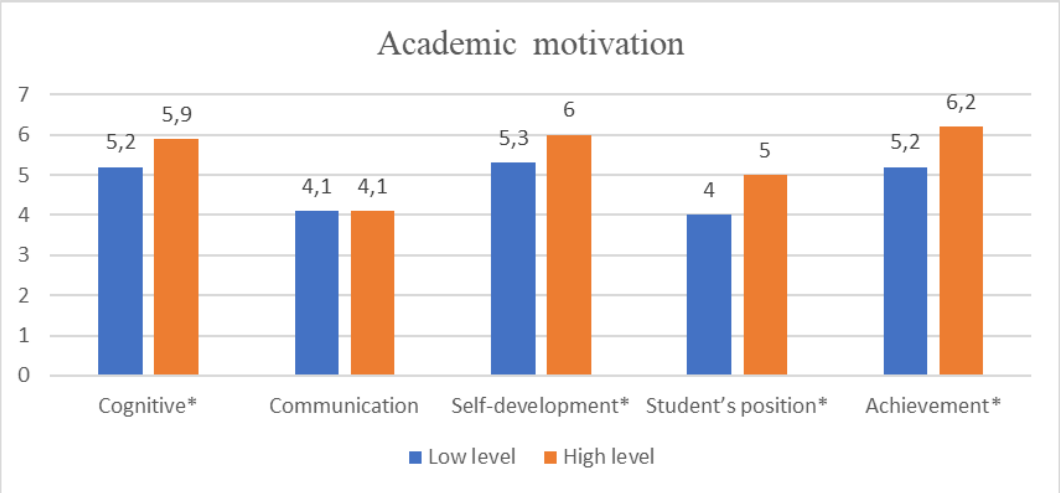
	School	SESC	Sirius	Overall sample
Low level of meaningfulness of life	79%	56%	63%	70%
High level of meaningfulness of life	21%	44%	37%	30%

Table 2 shows the distribution of the respondents from various educational institutions according to the meaning-in-life orientations levels in the above-mentioned ratio. However, when examined separately within each institution, it can be found that more than 30% of SESC students have a high level of meaning-in-life orientations. Furthermore, the groups of respondents were distributed almost equally in the Specialized Educational and Research Centre of the Southern Federal University. From this we can conclude that gifted students have greater motivational strength to seek themselves in life and strong self-control; they strive for greater expression of social desirability in relation to themselves.

As shown in Figure 1, representatives of the group with a high level of meaning-in-life orientations have higher scores of academic motivation, which promotes self-development, knowledge acquisition and new ways of solving problems. Comparison analysis showed statistical differences in cognitive motivation, motivation for self-development, student's position, and achievement motivation that were significantly higher among students with high scores in meaning-in-life orientations ($p \leq 0.05$).

Figure 1

Average scores of the academic motivation scales among the respondents with high and low integral parameters of Meaningfulness of Life, MLO test



Note: ** The statistical significance of differences is noted ($p \leq 0.05$).*

When comparing the communication characteristics of respondents, we found a different pattern. Students with high levels of meaning-in-life orientations demonstrated higher scores in communication facilitating characteristics, while groups with low levels of meaning-in-life orientations had higher scores in characteristics preventing social contacts (Table 3).

Table 3
Average values of the SSIC scales for students with different meaning-in-life orientations levels

SSIC scales	High level meaning-in-life orientations	Low level meaning-in-life orientations
Ease*	7.0	8.1
Skills *	7.2	8.1
Self-respect*	5.8	6.5
Lack of communication*	5.9	5.0
Alienation*	5.7	4.8
Shyness*	5.7	4.5
Loneliness*	5.5	4.4
Confidence*	6.8	7.8

Note: ** The statistical significance of differences is noted ($p \leq 0.05$).*

Next, to identify the relationships of meaning-in-life orientations with academic motivation and communicative characteristics of students, a correlation analysis using the Spearman correlation coefficient was performed between groups of students from SESC and secondary schools, as well as between students with high and low levels of meaning-in-life orientations (Table 4).

Table 4

Spearman correlation analysis of the MLO integral parameter with academic motivation for different groups

Academic motivation	SESC	Secondary school	High level of meaningfulness of life	Low level of meaningfulness of life
Cognitive	0.17*	0.2	0.08*	0.15
Communication	0.16	-0.05	0.11	0.01
Emotional	-0.04	-0.02	0.01	0.05
Self-development	0.12	0.19*	0	0.18*
Student's position	0.3*	0.1	0.08	0.13
Achievement	0.26*	0.23*	0	0.26*
External motivation	0.02	-0.08	-0.16	0.05

Note: ** p-value ≤ 0.05*

The analysis results (Table 4) showed statistically significant correlations between academic motivation and meaningfulness of life ($r = 0.17$; $p \leq 0.05$), as well as meaningfulness of life and the student's position ($r = 0.3$; $p \leq 0.05$) and achievement motivation ($r = 0.26$; $p \leq 0.05$) in the group of students from gifted education centers. At the same time, we found a correlation with the 'self-development' scale in the group of students with a low 'meaningfulness of life' score ($r = 0.26$; $p \leq 0.05$) and from secondary schools ($r = 0.23$; $p \leq 0.05$).

Therefore, for students studying at gifted education centers, most of whom have a high level of meaning-in-life orientations, the priority during training is to acquire new knowledge, to understand the main principles and ideas of the area of interest. They can independently regulate their learning activities and formulate the results they want to achieve. On the other hand, students with a low level of meaning-in-life orientations enjoy the learning process more and have the goal of developing creativity and finding nontrivial solutions to problems.

Among all groups, there is a tendency to maintain negative relationships between meaning-in-life orientations and characteristics that impede communication and positive relationships with facilitative characteristics, regardless of the level of meaning-in-life orientations and educational institutions (Table 5), which is confirmed by comparison analysis data. In addition, students studying at gifted education centers showed the strongest correlations among all respondents, while students with a low level of meaning-in-life orientations showed a weaker relationship between meaningfulness of life and communication characteristics.

Table 5

Spearman's correlation analysis of the MLO Meaningfulness of Life integral parameter and the SSIC scales

Meaningfulness	SESC	Secondary school	High level of meaningfulness of life	Low level of meaningfulness of life
Ease	0.35*	0.16*	0.26*	0.19*
Communication skills	0.36*	0.2*	0.31*	0.22*
Self-respect	0.31*	0.17*	0.23*	0.17*
Lack of communication	-0.26*	-0.26*	-0.36*	-0.17*
Alienation	-0.36*	-0.17*	-0.24*	-0.18*
Shyness	-0.33*	-0.18*	-0.26*	-0.13
Confidence	0.29*	0.19*	0.18	0.17*
Loneliness	-0.39*	-0.29*	-0.29*	-0.28*

Note: * p-value ≤ 0.05.

At the next stage, using multiple regression analysis we calculated the probability of changes in students' meaning-in-life orientations depending on their academic motivation and communicative characteristics. Since the correlation analysis showed a significantly positive relationship between meaning-in-life orientations and achievement motivation, responsible for achieving goals or obtaining results, in the first logistic regression model the dependent variable was a binary indicator of life performance. Results above 0.5 standard deviations were interpreted as 1 (high), otherwise - 0 (low). The characteristics

of communication and the type of educational institution were considered independent variables. The control variables were the gender and age of the respondents. The results of the model are shown in Table 6, and the marginal effect is shown in Figure 2.

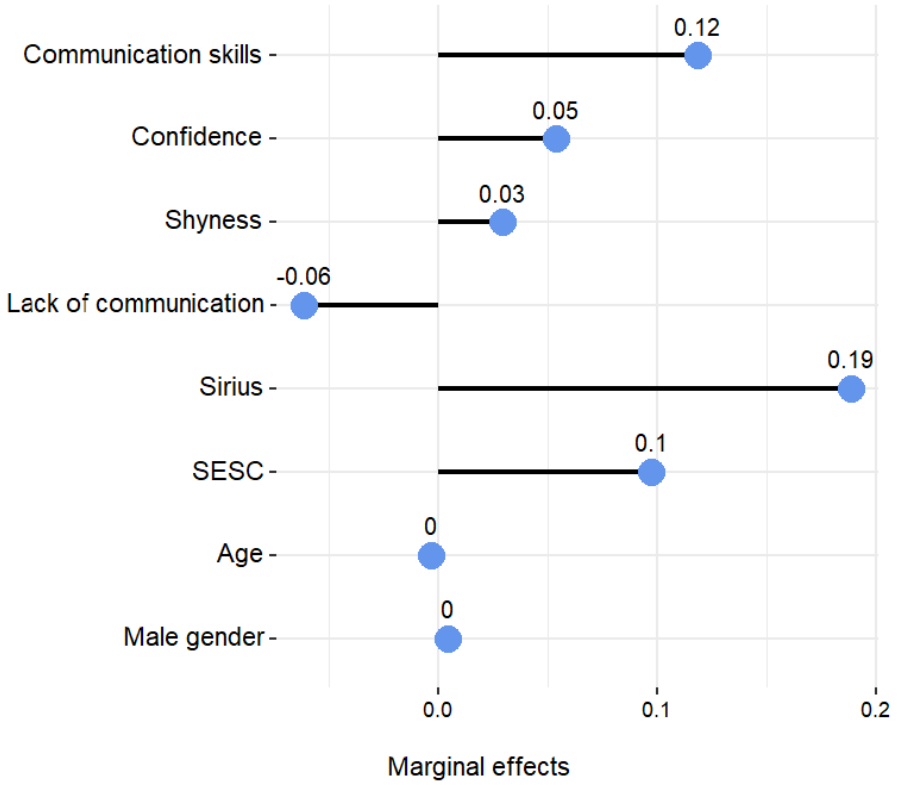
Table 6

Results of logistic regression of the impact of communication characteristics on students' self-efficacy in various educational institutions

Scales	Efficacy	Marginal effect
Communication skills	0.65 (0.18) ***	0.12
Confidence	0.29 (0.16) •	0.05
Shyness	0.16 (0.18)	0.03
Lack of communication	-0.34 (0.17) *	-0.06
Sirius	0.98 (0.33) **	0.19
SESC	0.54 (0.38)	0.1
Age	-0.02 (0.1)	0
Male gender	0.02 (0.3)	0
Intercept	-1.05 (1.62)	-
Pseudo R^2	0.13	
N	280	

Note: *p-value ≤ 0.0001 ***; 0.001**; 0.01 *; 0.05 • Reference group for educational institution – secondary school; reference group for gender – female.*

Figure 2
Marginal effects of predictors influencing a high level of life efficacy



The results of the model showed that students with strong communication skills are 12% more likely to be in a group with high life efficacy. Confidence increases the likelihood of a high life efficacy by up to 5%, while Uncommunicativeness reduces this probability by up to 6%. Shyness did not show the required statistical significance. The Sirius students (up to 19% reliably) and the SESC students (up to 10% at the level of a statistical trend) are more likely to be in a group with a high score in the Life Efficacy scale, compared to secondary school students. The factors of gender and age showed a slightly small marginal effect.

In the second logistic regression model, the Meaningfulness of Life variable was used as Y. The Student's Position, Cognitive Motivation, Self-Respect, Feeling of Loneliness and educational institution were taken as independent X. The gender and age of the respondents were also taken as control variables. The results of the model are shown in Table 7; the marginal effects are illustrated in Figure 3.

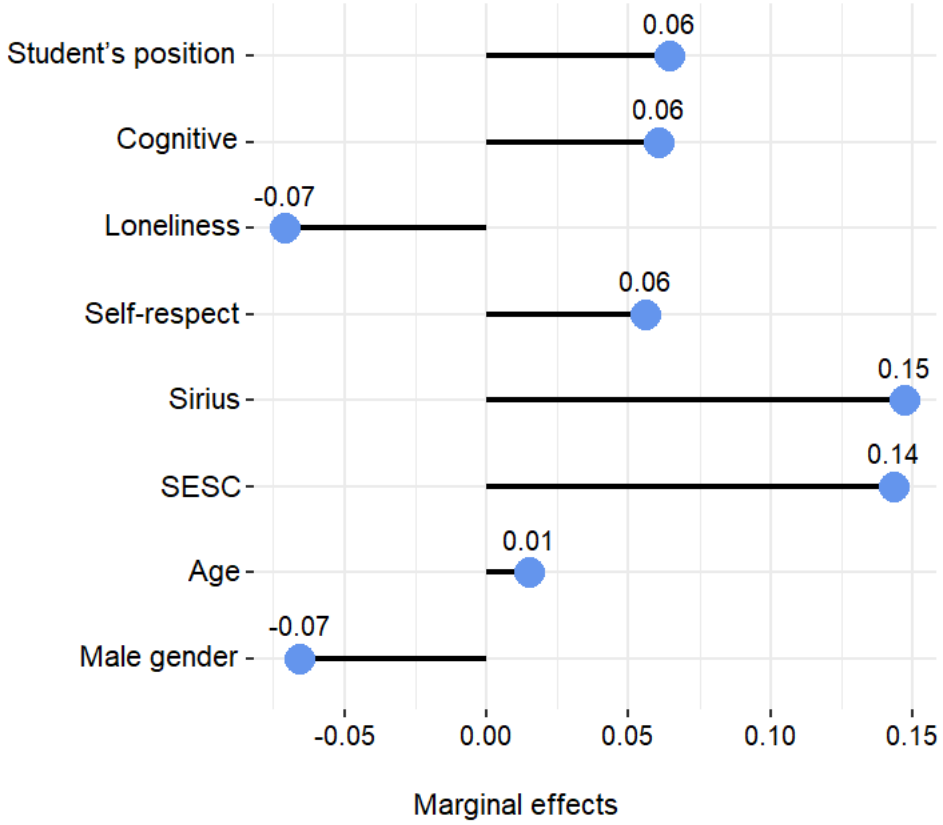
Table 7

Logistic regression of the impact of academic motivation and communicative characteristics on the meaningfulness of life of students in various educational institutions

Scales	Meaningfulness of life	Marginal effect
Student's position	0.36 (0.15) *	0.06
Cognitive motivation	0.33 (0.15) *	0.06
Loneliness	-0.39 (0.15) *	-0.07
Self-respect	0.31 (0.15) *	0.06
Sirius	0.79 (0.34) *	0.15
SESC	0.77 (0.38) *	0.14
Age	0.08 (0.1)	0.01
Male gender	-0.37 (0.3)	-0.07
Intercept	-2.47 (1.58)	-
Pseudo R2	0.12	
N	280	

Note: *p-value ≤ 0.0001 ***; 0.001 **; 0.01 *; 0.05 • Reference group for educational institution – secondary school; reference group for gender – female.*

Figure 3
Marginal effects of predictors influencing a high level of the Meaningfulness of Life integral parameter, MLO



Regression analysis showed that the Student's Position and Cognitive Motivation can increase the likelihood of a high level of meaningfulness in life by up to 6%. At the same time, Self-Respect, when increased by one standard deviation, can significantly increase the Meaningfulness of Life integral parameter up to 6%. The feeling of loneliness can reliably reduce the Meaningfulness of Life integral indicator by up to 7%.

An interesting result is the statistically significant effect of training in a specialized center on high levels of meaning-in-life orientations. Compared to secondary school students, the SESC students have up to 14% and the Sirius students have up to 15% higher meaningfulness of life.

Discussion

Respondents studying at the Sirius Educational Center and secondary schools have a significantly lower level of meaningfulness of life than the SESC students. This may be

due to the fact that the SESC conducts a multi-stage selection of students, and students consciously choose an educational institution with strict admission criteria and a more intensive educational program. Accordingly, they better understand and are able to distribute available resources and opportunities, demonstrate more conscious behavior, which is confirmed by the results of a study by A. A. Rodina and N. G. Abrahamyan devoted to the connection between meaning-in-life orientations and academic performance (Rodina & Abrahamyan, 2019). This assumption is also consistent with the data we obtained for the Life Goals and Efficacy scales, MLO test by D. A. Leont'ev. T. E. Fedoseeva and E. D. Mineeva also found that the results of the activity (89%) were more important for gifted students than its process (77%). Gifted students limit their social circle, focus on internal sensations, count only on their own abilities, and determine successes and failures exclusively by internal factors (Fedoseeva & Mineeva, 2020).

When comparing groups with low and high integral parameters of meaningfulness of life, significant differences were found in cognitive motivation, motivation for self-development, achievement motivation, and the student's position ($p \leq .005$), which is also confirmed by correlation analysis. The results showed that students studying gifted education centers, 40% of whom have high scores in meaningfulness of life, also have higher rates of academic motivation, compared to schoolchildren, only 21% of whom have high scores of meaning-in-life orientations. At the same time, among the SESC students, we found relationships of achievement motivation and the student's position with meaningfulness of life. Similar results were obtained by T. A. Dvoretskaya and L. R. Akhmadieva, "the internal motive of success as a result of individual activities is associated with the scale of the life process and life efficacy" (Dvoretskaya & Akhmadieva, 2018, p. 173).

On the other hand, a relationship between self-development and achievement was revealed among schoolchildren and students with a low level of meaning-in-life orientations. Perhaps these students strive for learning and self-development, but the focus of their efforts is aimed at solving specific here-and-now problems, which does not affect their meaning-in-life orientations.

Correlation analysis showed significant positive relationships between meaning-in-life orientations and characteristics that facilitate communication, such as self-respect, and negative relationships with characteristics that hinder communication, such as Lack of Communication, Shyness, and Feeling of Loneliness ($p \leq 0.05$). We should note that among students studying at gifted education centers and among students with a high level of meaning-in-life orientations, the relationships are more pronounced than among representatives of other groups. The comparative analysis also showed that respondents with a high level of meaning-in-life orientations had significantly ($p \leq 0.05$) higher scores in communicative characteristics that facilitate communication, while, on the contrary, the group with a low level of meaning-in-life orientations had higher scores in communicative characteristics that hinder communication. Thus, communicative characteristics depend on the level of meaningfulness of life, but do not depend on the type of the educational institution.

To test the hypothesis that educational institutions have an impact on the level of meaningfulness of life, several regression analyses have been carried out.

The first model showed that studying in the Sirius Educational Center significantly increased the probability that the student would achieve a high level of success in life. At the Sirius, training is structured around an intensive, accelerated learning schedule that includes daily master classes, advanced classes, and experiments. Students discover new opportunities for developing their talents through meetings with scientists and specialists in narrow fields, consultations with highly qualified teachers, as well as working on their own projects, intellectual products and creative works. N. B. Shumakova notes that such acceleration and enrichment of the educational program confirms the positive effect on academic motivation and academic success, and the development of students' social intelligence (Shumakova, 2020).

Over a short time of education, young researchers cover new areas of personal development previously unavailable in order to continue to work in their schools in a new way and continue to promote their efforts at competitions and conferences. The strict selection of students enables the formation of classes/teams with an optimal psychological environment where talented students develop their talents among equally strong students who have research interests in a similar field of science. Therefore, support for academic motivation in learning processes is confirmed by the data obtained from the second regression model: Achievement motivation and the student's position are statistically higher among the Sirius and SESC students than among secondary school students.

Conclusion

This article analyzes various aspects of teaching children with high educational needs, taking into account their meaning-in-life orientations, academic motivation, and communicative characteristics.

Compared to secondary school students, those studying at gifted education centers have a higher level of meaningfulness of life. In turn, academic motivation is significantly higher among students with a high Meaningfulness of Life integral parameter, MLO. Students have formed a better idea of their strengths and possible growth points, and are prepared to undergo a multi-stage selection. In contrast to secondary schools, such centers offer 'enriched education' which includes additional extracurricular disciplines in the educational program, stimulating children's research interests, promoting the development of motivation, intellectual abilities and creativity.

Communication characteristics are largely dependent on the level of meaning-in-life orientations than on the educational institution in which the respondent studies. Consequently, when implementing an educational program in gifted education centers, the use of project-based and asynchronous learning technologies, massive open online courses, accelerated learning instruments (intensives), foresight sessions and

brainstorming, as well as an effective combination of summer programs, make it possible to best stimulate social-emotional, creative and intellectual development of students.

Methodological recommendations for teachers and educational psychologists

The findings of the study provided the basis for methodological recommendations for teachers and educational psychologists working in gifted education centers such as SESC and Sirius. The following are the main ideas for the recommendations we have developed.

- First, psychologists and program staff should acquaint students with the program of psychological and pedagogical support. This promotes rapid psychological adaptation, helps recognize a trusting relationship and enables children to understand that they can be supported in selecting an individual learning path, assists in socialization and career guidance, and facilitates interactions with the teaching staff and management of the institution.
- To prevent conflicts and feelings of isolation, it is necessary to include in the educational process group training projects, master classes, foresight sessions, and seminars where students are also speakers.
- We should not forget the encouragement and motivation for self-development. It is important to invite students to find solutions independently, to guide their desire to seek answers to questions about unknown and discovered phenomena, and to reveal the creative ways of understanding the world.
- To develop cognitive motivation and strengthen self-confidence, it is necessary to use reversal and problem-based learning methods, project-based and interactive technologies to best demonstrate children's extraordinary abilities.

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Annex 1

Descriptive statistics for the scales of the test of the Structure of Schoolchildren's Educational Motivation and the test of Self-Regulation and Success of Interpersonal Communication

Table 1

Descriptive statistics, Structure of Schoolchildren's Educational Motivation

Academic motivation scales	Institution	N	Mean	Sd	Median	Min	Max	H
Cognitive	School	149	5.03	1.69	5	1	9	14.13**
	SESC	55	5.8	1.61	6	2	9	
	Sirius	75	5.84	1.58	6	3	9	
Communication	School	150	4.27	1.81	4	0	9	14.78**
	SESC	55	4.58	1.90	5	1	9	
	Sirius	75	3.37	1.79	3	0	7	
Emotional	School	150	4.33	1.99	4.5	0	9	3.38
	SESC	55	4.89	2.14	5	0	9	
	Sirius	75	4.28	1.75	5	1	9	
Self-development	School	150	5.11	1.81	5	0	9	15.40**
	SESC	55	6.04	1.71	6	1	9	
	Sirius	75	5.89	1.93	6	1	9	
Student's position	School	150	3.94	2.15	4	0	9	10.79**
	SESC	55	5.16	2.5	6	0	9	
	Sirius	75	4.36	2.51	4	0	9	
Achievement	School	150	4.9	2.24	5	0	9	21.79**
	SESC	55	6.4	1.94	7	2	9	
	Sirius	75	5.95	2.31	6	0	9	
External motivation	School	150	4.39	1.98	5	0	9	3.74
	SESC	55	4.71	2.08	4	1	9	
	Sirius	75	3.92	2.02	4	0	9	

Note: p-value ≤ 0.001 ***; 0.01 **; 0.05 *. *H is the coefficient of comparative analysis, the Kruskal-Wallis test.*

Table 2

Descriptive statistics, Self-Regulation and Success of Interpersonal Communication

Communication characteristics scales	Institution	N	Mean	Sd	Median	Min	Max	H
Ease	School	150	7.19	2.79	7	1	14	19.76**
	SESC	55	8.80	3.08	10	0	12	
	Sirius	75	6.45	3.12	6	0	12	
Communication skills	School	150	7.29	2.18	7.5	2	14	9.27**
	SESC	55	8.35	2.20	8	3	12	
	Sirius	75	7.32	2.40	7	2	12	
Self-respect	School	150	6.03	1.88	6	2	12	6.24**
	SESC	55	6.58	1.84	8	2	11	
	Sirius	75	5.67	2.44	6	1	11	
Lack of communication	School	150	5.75	2.04	6	1	13	8.39**
	SESC	55	4.85	2.24	5	1	10	
	Sirius	75	5.95	2.16	6	1	10	
Alienation	School	150	5.40	2.42	5	1	12	14.11**
	SESC	55	4.44	2.42	7	0	11	
	Sirius	75	6.13	2.46	6	1	11	
Shyness	School	150	5.53	2.47	6	0	12	8.89**
	SESC	55	4.40	2.64	5	0	11	
	Sirius	75	5.57	2.86	5	0	12	
Loneliness	School	150	5.25	2.50	5	0	12	8.03**
	SESC	55	4.35	2.60	4	0	10	
	Sirius	75	5.67	2.86	6	0	10	
Confidence	School	150	6.93	2.32	7	2	12	2.06
	SESC	55	7.56	2.46	7	2	12	
	Sirius	75	7.19	2.45	7	2	12	

Note: p-value ≤ 0.001 ***; 0.01 **; 0.05 *. *H is the coefficient of comparative analysis, the Kruskal-Wallis test.*

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Author Contribution

Liudmila Aleksandrovna Dikaya developed the main concept and methodology of the study, selected diagnostic tools, prepared the plan and edited the text of the manuscript, worked with foreign sources, and wrote the Abstract and Keywords.

Viktoriya Sergeevna Ryzhova overviewed relevant Russian studies, performed data processing using the R 4.1.3 software, interpreted the results, formulated conclusions, developed methodological recommendations.

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Conflict of Interest Information

The authors have no conflicts of interest to declare.