Specifics of Self-Regulation in Gifted Adolescents

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Abstract

The article presents the results of an empirical study of the development level of such regulatory skills, as "goal-setting", "planning", "modelling" and "results' evaluation" in gifted adolescents. In order to evaluate the regulatory skills in adolescents, we developed and standardized activity-oriented tasks that allowed assessing specifically the defined skills, rather than from the self-esteem of their presence. Considering the age specifics of the participants, the tasks were ranged according to their difficulty: for 12-13-year-old adolescents (students of 6-7th grades), and for 14-16-year-old adolescents (students of 8-9th grades). For the first time, we revealed and described the specifics of functioning of the conscious activity self-regulation system in the gifted adolescents. We described the defects of self-regulation in the functional segments and possibilities of their compensation.

Keywords: conscious self-regulation of activity; gifted adolescent; regulatory skills: "goal-setting", "planning", "modelling", "results' evaluation".

INTRODUCTION

The relevance of self-regulation in gifted adolescents consists in the fact that the regulatory characteristics of this sample have not been studied yet. Moreover, no previous studies have defined and described the regulatory skills of the gifted children; these skills include goal setting, ability to plan one's own activity, ability to model subjective and objective conditions of performing the activity, as well as the ability to evaluate the obtained result.

It is known that those regulatory skills (goal-setting, planning, modelling and evaluation of activity results) allow a subject to succeed in any activity and independently define the reasons of his/her successes and failures during the planning and execution of both individual and cooperative activity [1, 2, 3].

METHODOLOGY

Methodological basis of the study has been the conscious activity self-regulation that is being developed in the national paradigm of activity-based approach in the works of O.A. Konopkin [4, 5], V.I. Morosanova [6], A.K. Osnitskiy [7], G.S. Prygin [2], and others.

In his works (1980, 1995, 2004), O.A. Konopkin states that a well-developed self-regulation system allows its subject to construct and regulate his own goal-directed activity, successfully solve nonstandard problems, be independent and master new forms and types of activity. The author proves that spontaneous development of separate functional blocks, as well as the whole self-regulation system in general, leads to its defects. In practice, we can observe different effectiveness of the conscious self-regulation of activity.

The studies in this field allowed describing different styles of self-regulation [6] and define typological specifics of "autonomous", "mixed" and "dependent" individuals [2, 3].

According to the foreign authors, educational failures of gifted school students are caused by various internal and external reasons that prevent the actualization of their achievement potential, which is often more accessible by their less skillful peers. The individual factors include self-regulation defects (lack of organization, impulsivity) and maladaptive strategies (inability to set realistic goals, predominant use of short-term, rather than long-term, strategies of overcoming the obstacles) [8].

The "Effective paradigm of giftedness" summarizes the current state of knowledge in the psychology of giftedness, and giftedness is defined as "systematic personality quality that develops throughout lifespan and defines a person's ability to achieve higher (extraordinary, outstanding) results in one or more types of activity in comparison with other people" [9].

The foreign authors define giftedness as a potential for outstanding achievements in one or more fields of activity [10, 11, 12].

In our study, the concept of giftedness has a rather wide context: we address giftedness from the humanitarian perspective as a certain potential ability to learn cultural examples and succeed in the activity; this ability can be achieved by any person [13].

The aim of our study is to explore and describe the regulatory skills (goal-setting, ability to plan one's own activity, ability to model objective and subjective conditions of activity execution) in gifted adolescents, and to reveal the specifics of functioning of the self-regulation system in the gifted students.

We hypothesized that the self-regulation system in gifted adolescents was more integral and effective than in ordinary students; self-regulatory skills were developed at a high level: gifted adolescents were able to set goals, develop a program of executive actions according to objective and subjective conditions and evaluate the activity result by corresponding it with the set goal.

Our predictions are based on the fact that:

− Additional educational activity that involves the gifted adolescents requires them to have well-developed regulatory abilities (planning their time and actions, evaluating the conditions of their execution, etc.);

− Since the regulatory skills are tightly linked to the level of intelligence (primarily, theoretical thinking), gifted adolescents have higher chances to master the self-regulation skills compared to the ordinary students.

Previous studies showed that gifted school students were capable of independently planning their programs for accelerated education [14] and were more precise in evaluating the difficulty of a problem and probability of succeeding in a given situation [15].

ORGANIZATION OF THE STUDY

We conducted an empirical study in order to define the specifics of regulatory skills in gifted adolescents. The sample consisted of 338 participants in the age of 12-16 years. Participants in the study were school students from different educational institutions: general-education schools, gymnasium-type schools and art schools in Naberezhnye Chelny.

In order to study the regulatory skills of gifted adolescents, we divided the sample in two groups: the first (experimental) group included the adolescents that studied in gymnasium and art schools (n=160); we provisionally defined this group as gifted adolescents. The second group consisted of the adolescents that studied in the general-education school (n=178); this group was considered to be a control one. The students from that group did not attend the institutions of additional education and they did not demonstrate high potential skills.

Regulatory skills (goal-setting, planning, modelling and evaluation) were diagnosed with specially developed tasks in which the participants were required to perform a certain action, from setting the goal to evaluating the result. It is necessary to point out that the tasks were created in a way that required the participants to perform an action, rather than to demonstrate knowledge or state an opinion about a certain issue. For example, in order to evaluate a student's regulatory skills, the student would have to set a specific goal and then create a plan for its achievement (or on contrary, nonachievement). Then the student was asked to evaluate the obtained result according to the set goal and the criteria of its evaluation. Such form of tasks allowed assessing specifically regulatory activity-related characteristics of the participants, rather than their knowledge about them.

It is necessary to note that the tasks were created in accordance with the participants' age specifics. We developed two sets of diagnostic materials – for 6-7th-grade students (12-13 years old), and for 8-9th-grade students (14-16 years old).

ANALYSIS OF THE RESULTS

The results of self-regulation skills diagnostics in school students were analyzed with SPSS software. The obtained results are presented in Table 1.

In order to compare the self-regulation skills in students from the group of gifted students and the control group and to define significant differences in regulation skills, we analyzed the obtained data using Mann-Whitney U criterion for independent samples. This criterion was chosen since the data of one of the groups did not pass the criterion for normality of distribution, and therefore, parametric criteria could not have been used [16].

Significant differences ($p \leq 0,001$) we revealed between 12-13-year-old students (gifted students and the control group) for

all regulatory skills (goal-setting, planning, modelling and evaluation). Therefore, the ability to set a goal, execute the actions of planning according to internal and external conditions of activity execution and evaluate the activity results according to the set goal was developed better in gifted students, compared to the control group. This means that the participants of the experimental group are capable of independently constructing their activity, starting from setting the goal and finishing with evaluating its results according to the developed criteria; they do not need an additional impulse, such as a teacher, a mentor or a parent, to begin the activity. These adolescents are independent during the goal-setting, as well as during the achievement of that goal and the evaluation of the intermediate and final results; they succeed in the activity, because the regulatory abilities help the subject of activity to reach the set goals.

It is necessary to point out that, in the control group, the scores on all of the scales ("goal-setting", "planning", "modelling" and "evaluation") were significantly different among the students. This group contains both the students with low levels of ability to set the goals, plan the execution of their own actions, model various conditions of the activity execution and evaluate the final result, and the students that have a rather high level of the regulatory functions. In other words, the participants from the control group are less similar to each other in the level of regulatory abilities' development than the adolescents from the "gifted" group. The group of gifted adolescents of 12-13 years of age was homogeneous in the characteristics of self-regulation skills' development; there was no dispersion of the individual characteristics.

**Table 1 – Descriptive statistic of the self-regulation skills**

Age	Statistic	Goal-setting		Planning		Modelling		Evaluation	
		"E"	"C"	"E"	"C"	"E"	"C"	"E"	"C"
12-13 years	M	7.09	5.78	6.48	4.69	4.55	3.3	6.43	4.03
	δ	2.61	2.03	1.8	2.36	1.85	2.01	1.69	2.28
14-16 years	M	7.36	4.55	4.9	3.3	4.15	4.24	7.87	5.15
	δ	2.2	1.52	2.11	2.22	1.54	1.69	3.38	2.29

a) M – mean;
b) δ – standard deviation;
c) "E" – group of gifted students;
d) "C" – control group.
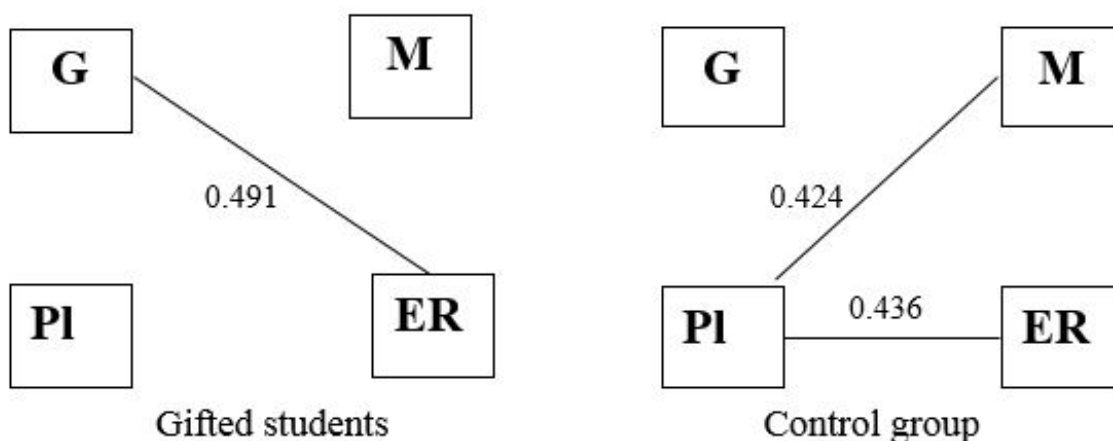
a) G – goal-setting;
b) M – modelling;
c) Pl – planning;
d) ER – evaluation of results;
e) The correlations are significant at p = 0,01.

Figure 1. System of conscious self-regulation of activity in 12-13-year-old adolescents
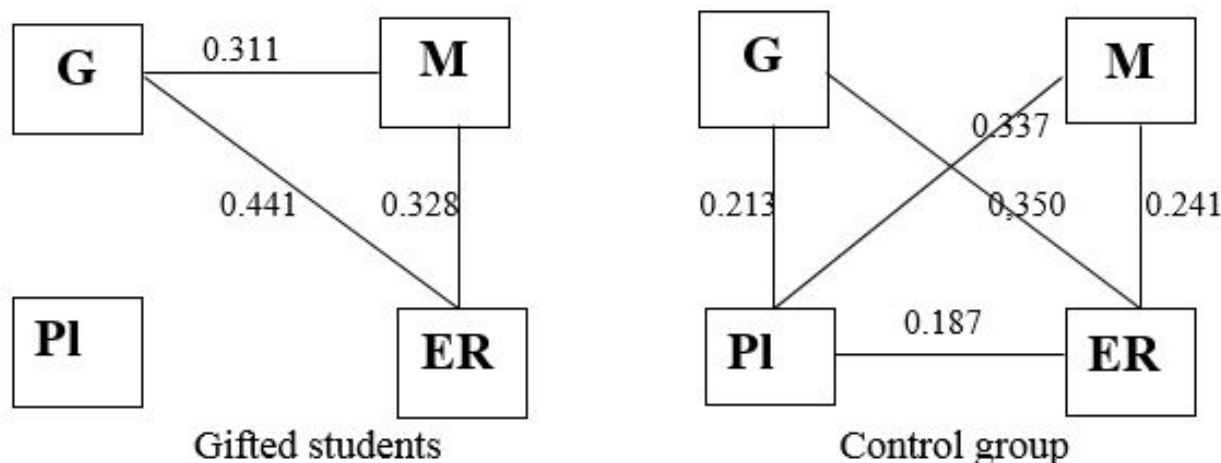
a) G – goal-setting;
b) M – modelling;
c) Pl – planning;
d) ER – evaluation of results;
e) The correlations are significant at p = 0,01.

Fig. 2. System of conscious self-regulation of activity in 14-16-year-old adolescents

Analysis of the empirical data in the group of 14-16-year-old participants revealed the following. Compared to the control group, gifted adolescents showed higher level of development of the abilities to set goals, plan and evaluate the final result of the activity. In other words, gifted adolescents were more precise then the control group in stating the goal of the activity, developing the program of executive actions for its achievement and evaluating its results. The data revealed no significant differences between gifted students and students of the control group in the "modelling" scale in the age group of 14-16-year-old adolescents. This suggests that the differences in the regulation of one's own activity diminish with age, and therefore, the abilities to evaluate objective and subjective conditions of activity execution manifest at approximately the same level in all adolescents. In order to improve the regulatory ability to evaluate the conditions and model various ways to execute the activity, gifted adolescents need the assistance of a mentor (teacher or parent) and special training of this ability.

It is necessary to note that some regulatory skills in the group of gifted adolescents have a tendency of decreasing. The ability to plan their activity according to the goal ("planning" scale) had lower scores in 14-16-year-old gifted adolescents compared to the gifted adolescents of 12-13 years of age. We see the reason for this in the fact that the potential of a gifted adolescent, not being required, diminishes, and the regulatory skill does not develop at the same rate. Therefore, in order to avoid slowing down the rates of the planning ability development, it is necessary to implement the assistance of a mentor. The role of the mentor would consist in organizing gifted adolescents' activity, helping to plan and develop a program of executive actions in order to reach the specific result.

SPECIFICS OF FUNCTIONING OF THE SELF-REGULATION SYSTEM IN GIFTED ADOLESCENTS

According to the paradigm of conscious self-regulation of activity, one of the characteristics of the effectiveness of the system's functioning is the level of coherence among functional segments of the self-regulation system [3, 5, 7].

In order to study the specifics of regulatory skills in gifted school students, it is not sufficient to define just the level of development of a certain functional segment of self-regulation (goal-setting, planning, modelling and evaluation). It is also necessary to define the specifics of the functional connections that form among structural components of the conscious self-regulation of activity. Essentially, the issue of functional connections is the issue of the coherence in the functioning of separate segments as a unified system. For now, this field remains barely studied; in this aspect, in the context of our work, we will conduct a correlation analysis among the functional segments (goal-setting, planning, modelling, evaluation) and will define the functional coherence of regulatory abilities in the group of gifted adolescents and the control group.

In order to reveal the interaction among the functional segments, we conducted a correlation analysis with the Candall Tau-b criterion in the two groups; the choice of the nonparametric criterion was justified by the violation of the criterion of normality of distribution in the analyzed variables [16]. As a result of the statistical analysis, we created correlation matrixes (Fig. 1).

As an interpretation of the obtained data, the matrixes demonstrate that the level of integration of self-regulation system is low in both groups. The group of gifted adolescents presented only one connection among the functional segments, namely, between the segment of goal-setting and the segment of results' evaluation. It is necessary to point out the importance of this connection. A gifted adolescent is capable of setting a goal of the activity and evaluate the obtained results on his/her own. The connection "Goal – Evaluation" is important from the perspective of developing effective independency and self-sufficiency. Other segments of the system, despite being developed at a higher level than in the control group, function separately from each other. In other words, in gifted adolescents, the plan of execution and the model of the conditions of goal achievement are not connected to the goal and the results evaluation. In principle, the activity is possible because the adolescents initiate it on their own, although later there might be defects in the planning [3]. However, the evaluation of the achieved results is related to the initial plan, which is important from the perspective of goal achievement.

As for the matrix of the control group, we found two connections – between the functional segments of "planning" and "modelling", and between the segments of "planning" and "evaluation of results". These data show that the participants of the control group construct their plans according to external and internal conditions of activity execution. Another specific trait is the fact that results' evaluation is conducted in correspondence

with the developed plans. Absence of connections with the segment of "goal-setting" shows that the students of this group have trouble with setting the goal of the activity on their own; unlike the gifted students, they depend on a teacher or a mentor and wait for help. In other words, despite the fact that this group has more connections than the group of gifted adolescents, this group would not initiate the activity without the help of a mentor, which means that the students depend on the adults. As stated above, the gifted students are more self-sufficient in this aspect.

We will further analyze the correlation matrixes and present the following data (Figure 2).

As the figure shows, the number of correlations in the system increases due to the age-related changes, in particular, with the development of higher cognitive functions [17]. In the students of the group of gifted students, compared to the 12-13-year-old students, the activity goal is related not only to its evaluation but also with the ability to consider external and internal conditions of activity execution. The adolescents adequately evaluate their abilities and are able to regulate, for example, the degree of difficulty of the goal. They develop an ability to flexibly construct external objective conditions of the activity that can only be considered. The connection between modelling and results' evaluation points to the fact that they develop the regulatory skill of evaluating intermediate results during the activity execution.

However, we would like to note that one specific trait of the regulatory abilities in the group of gifted students was the isolation of the planning segment. This regulatory defect means that gifted adolescents are not able to flexibly change their activity plans according to the changing conditions of its execution (there is no connection between planning and modelling) [3]. The lack of connection between planning and goal-setting points to the fact that the plans of gifted students might be disconnected from the goal; the lack of planning is not evaluated at the end of the activity, because there is no connection between planning and result evaluation.

From the psychological perspective, the obtained data suggest that the gifted adolescents begin to execute an activity immediately after setting a goal without performing the regulatory actions of planning that are essential from the perspective of the activity effectiveness. Probably, the urge to fulfill the goal quickly, as well as impulsiveness and uncontrollable energy, do not allow these subjects to gradually develop a program of executive actions that consider external and internal conditions of activity execution. Naturally, such trait of self-regulation leads to the inevitable decrease in activity successfulness and acts as a defect that requires developing compensatory mechanisms. In other words, these students need a mentor who would teach them the missing regulatory skills and help the gifted adolescents to conduct conscious self-regulation of their actions in this segment of the self-regulation system [18] (to develop a program of executive actions according to the set goal and evaluate the effectiveness of the completed activity not only according to the result but also according to the process).

The students of the control group have a more integral self-regulation system compared to the group of gifted students, which contradicts our hypothesis in this part of the study. Regulatory skills of the students of the control group function as a system. We can observe the absence of only one connection – between goal-setting and modelling. The self-regulation defect presents in the fact that the participants of this group do not evaluate the conditions of activity execution; they begin planning and executing their actions right after setting the goal. This trait might lead to unrealistic goals, because they are disconnected from the real conditions of their achievement.

CONCLUSION

To summarize, the conducted empirical study allowed reaching its aim and revealing the specifics of development and functioning of the system of conscious activity self-regulation.

The study established that gifted adolescents had higher level of development of three regulatory skills, namely, goal-setting, planning and evaluation, in comparison with the adolescents from the control group. The ability to model relevant activity conditions was developed better in 12-13-year-old gifted students than in the control group; however, at the age of 14-16, there were no significant differences in this regulatory skill.

The second discovery of the study consists in the fact that the difference between the groups of participants in the modelling skill diminishes with age. In other words, the older gifted adolescents get, the less is their advantage over their peers in the ability to analyze external and internal conditions of activity and to model the conditions relevant for achieving the goal.

The third finding is the fact that, in the gifted students, the functional segments of the self-regulation system are not integrated in a unified formation. 12-13-year-old gifted students have only one connection (between the segments of goal-setting and results' evaluation). By 14-16 years of age, the number of connections among the segments increases, however, the planning segment becomes isolated, which inevitably leads to self-regulation defects and decrease of effectiveness in goal achievement. The self-regulation system in the students from the control group is more integral and coherent, despite lower level of development of each of the regulatory skills separately.

The obtained results are practice-oriented. Based on the correlation matrixes and the revealed specifics of the regulatory skills, it becomes possible to create a program for developing the regulatory skills in gifted school students. Gifted adolescents need help of a mentor that would teach them the ways of planning according to the set goal and the conditions of its achievement.

NOTES

An example of the task for 12-13-year-old students aimed at assessing the abilities to model the condition and plan the activity. "You and your father decided to grow a flower for your mother for the 8th of March celebration. Create a plan of your actions:
– Look at the suggested actions and select the ones that are necessary (highlight them);
– Put the selected actions in the correct order (put the number near the action).
To grow the flower
Prepare the soil
Buy the book "Everything about flowers" by A.V. Moleva
Water the flower
Calculate the timing of this plant's blossoming
Ask friends for advice
Plant the flower
Choose the type of the plant
Buy Californian worms for the flower soil
Ask the biology teacher for advice
Take the flower pot out on the balcony from time to time
Become a member of flower-cultivating society
Buy a flower pot

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