

Longitudinal Study of Self-regulation of Junior Schoolchildren

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The research studies features of self-regulation of schoolchildren in the age of eight to nine and 11 to 12 years. The sample consisting of 30 students (12 boys and 18 girls) has been divided into two groups—students with good and poor school progress. The school results are compared with the results of neuropsychological tests and the level of learning motivation. The family upbringing style has been studied as well. In the course of neuropsychological research, the difference in the level of maturing of frontal lobes of brain has been found out. According to this fact, the level of self-regulation of each student was evaluated and every participant was marked as having high, medium or low level. The research showed that some defects of self-regulation of psychic states can be compensated. More serious defects prevent from maturing conscious self-regulation of activity even in the case of safe intellect. The style of family upbringing has influence on the maturing of the conscious self-regulation. High level of self-regulation corresponds to the adequate style of family upbringing, meaning that there is a balanced system of rights and duties for a child and his/her need for self-sufficiency is not ignored. On the contrary, low level of self-regulation usually combines with conniving hyper-protection and unsteady style.

Keywords: self-regulation, junior schoolchildren, family upbringing, learning motivation

Introduction

Different aspects of self-regulation are being widely discussed in modern psychological literature. Individual system of self-regulation integrates dynamic and contextual, conscious and unconscious structures of personality. Following Nikolaeva (1991), we consider self-regulation as a system process, supporting relevant to the conditions changeability, flexibility of person's life activity.

The three-level model of self-regulation introduced by Nikolaeva (1991) helps to explain the connections between certain parts of this system (see Figure 1). The first level is the level of self-regulation of psychic states, supporting the needed activation level. The second level is the operational level, providing conscious planning, fulfillment and correction of person's activities. The third level is the motivational level, allowing realizing the motives of activity and controlling them.

Various theories of self-regulation can be considered as relating to one or two levels of this model. Carver and Scheier's (1981; 1998; 2000) theory describes behavior as a process of movement towards the goal or away from anti-goal. Goals serve as reference values for feedback loops. Thus, the theory describes the interaction between motivational and operational level of self-regulation. The analysis of feedback loops can be referred to the operational level. The same conclusions can be applied to the theory of Konopkin (1980), describing the

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process of self-regulation also as a loop, consisting of six components: goal, conditions model, program of actions, success criterion, information about result and decision whether correction is needed. The process of the goal-setting corresponding motivational level of self-regulation is explained by the theory of Deci and Ryan (2002).

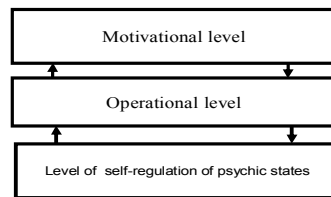


Figure 1. Three-level model of self-regulation.

The development of self-regulation is still little-investigated. Some researchers suppose that forms of self-regulation in the age of four to five years are not the beginnings of this ability, they are based on the previous stages (Bezrukhih & Loginova, 2002). According to Sultanova (2005), the development of regulatory systems starts during the prenatal period, when stem and sub-cortical structures are forming, and consequently, they are vulnerable to a range of factors, such as intoxication, hypoxia, etc.. Later, low level of self-regulation causes problems in various spheres of life. Pelco and Reed-Victor (2007) confirmed the connection among poor self-regulation of emotions, attention and behavior in early childhood and difficulties of school learning in later years. Gardner, Dishion, and Connell (2008) found out that the adolescents with deviant behavior have lower level of self-regulation than their peers not demonstrating antisocial tendencies. In a longitudinal research carried out on the sample consisting of 518 participants, Crockett, Raffaelli, and Shen (2006) showed that risky sexual behavior in the age of 16 to 17 years is associated with low level of self-regulation in the age of eight to nine years.

In the present research, we are intending to study the self-regulation of school activity from the positions of the three-level model of self-regulation and explain some reasons of poor progress in school learning.

Research Goals and Objectives

The goal of the current research was to define specific problems of self-regulation of schoolchildren in the age of eight to nine years and trace them in the age of 11 to 12 years.

According to this goal, the research had the following objectives:

- (1) To define the defects of the level of self-regulation of psychic states and to find out how they effect on self-regulation of learning activity;
- (2) To find out possible compensation actuators of self-regulation defects;
- (3) To explore the influence of the family upbringing on maturing of the motivational level of self-regulation.

Method

The research sample consisted of 30 schoolchildren of eight to nine years old with intellect within the age norm not having severe somatic diseases. At the second step, the age of children was 11 to 12 years old.

The basic method applied was the Luria's (2000) neuropsychological battery of tests, adapted by Semenovich (2002). In the course of neuropsychological research, we found out the problems of the level of self-regulation of psychic states. We took the school grades of the students as the results of self-regulation of their learning activities considering operational level of self-regulation. Motivational level was studied with the

tests of Guinsburg (1988, as cited in Ovcharova, 1996), O. S. Grebeniuk & T. B. Grebeniuk (2000) and Markova, Matis, & Orlov (1990).

The questionnaire of Eidemiller and Yustizky (1990)—analysis of “family upbringing” was used for exploring the family upbringing style and finding out the problems of the family upbringing, such as high level of hyper-protection, lack of self-confidence as a parent, preference of male or female character traits, etc..

We also used structured interview with parents for clearing some aspects of forming self-regulation in their families.

According to their school results, the schoolchildren were divided into two groups:

- (1) Students with good progress in learning;
- (2) Students with poor progress in learning.

Research Findings at the First Step

In the course of neuropsychological research, we found out the difference in the level of maturing of frontal lobes of brain. According to this fact, we evaluated the level of self-regulation of each student and marked every participant as having high, medium or low level.

Table 1

Progress in Learning Level of Self-regulation Crosstabulation*

		Level of self-regulation			Total
		High	Medium	Low	
Progress in learning	Good	4	8	7	19
	Poor	0	1	10	11
Total		4	9	17	30

As shown in Table 1, there were no students with high level of self-regulation in the group with poor school progress.

Statistically significant difference ($p = 0.000$) in Mann-Whitney test was obtained when comparing the results of neuropsychological research between groups with good and poor school progress. Thus, the students from the second group had more serious problems with learning (see Table 2).

Table 2

Results of Mann-Whitney Test

	Progress in learning	<i>N</i>	Mean rank	Sum of ranks
Results of neuropsychological tests	1	19	10.92	207.50
	2	11	23.41	257.50
	Total	30		

Test statistics	
	Results of neuropsychological tests
Mann-Whitney U	17.500
Asymp. Sig. (two-tailed)	0.000

We divided the sample into the following sub-groups:

- Sub-groups A1. Good school results, high level of self-regulation;
- Sub-groups A2. Good school results, medium level of self-regulation;
- Sub-groups A3. Good school results, low level of self-regulation;

Sub-groups B. Poor school results, medium and low level of self-regulation.

Mean grades in the sub-groups received in the course of neuropsychological research are shown in Figure 2.

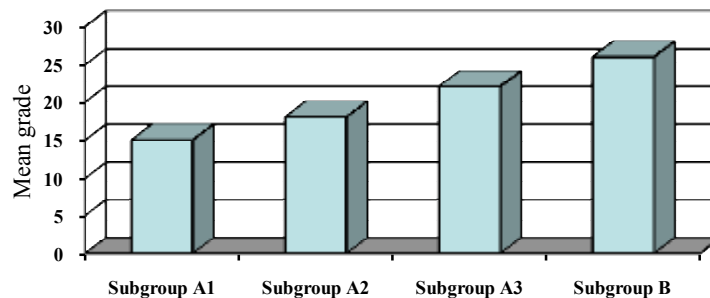


Figure 2. Mean grades of sub-groups in the neuropsychological tests.

The more mistakes a child made, the more was the grade, so the group with high level of self-regulation showed the best results and the group of students with poor progress in studies showed the worst result. Although the students from both groups had some deficiency of stem and sub-cortical structures, those defects were compensated better in the group of successful students.

There was no statistically significant difference in the level of learning motivation—practically all the students showed high school motivation. However, not for all of them whose results of learning activity were equally high as their motivation. The fact shows that motivational level of self-regulation does not become the leading one in the age of eight to nine years as the level of motivation not always determines the results of the activity.

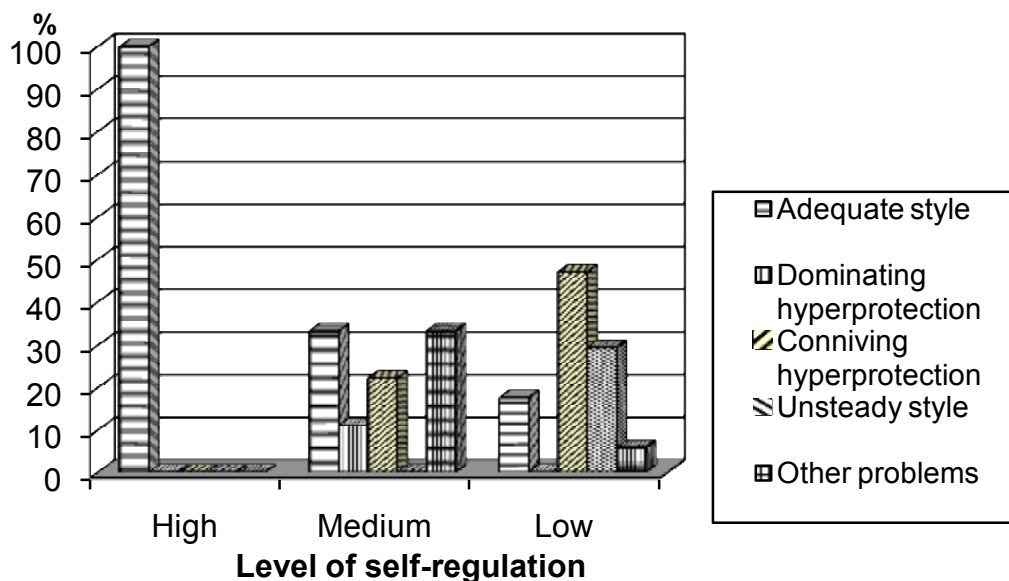


Figure 3. The style of family upbringing.

Figure 3 shows that high level of self-regulation corresponds to the adequate style of family upbringing, meaning that there is a balanced system of rights and duties for a child and his/her need for self-sufficiency is not ignored. On the contrary, low level of self-regulation usually combines with conniving hyper-protection and unsteady style. Although the sample range does not allow making statistically significant generalization, we

supposed that the above-mentioned results show the tendency.

Below, we would like to focus on each sub-groups.

Sub-groups A1. Good school results, high level of self-regulation. Four girls who formed this sub-groups were the best students in their classes. We could point out the motivational level of self-regulation as the leading one for those schoolchildren. Even if sometimes they had problems with concentration, the high level of learning motivation allowed them to compensate those problems. The students had real interest in the school subjects and always wanted to learn more.

In their families, they had a balanced system of rights and duties.

We could identify a possible danger for such students as overstraining, because sometimes they did not realize their exhaustion of the intellectual activities, so there could be a risk of nervous breakdowns and psychosomatic diseases. To prevent this situation, parents and teachers should help them keep a good balance between intellectual and physical activities, as well as between work and rest.

Sub-groups A2. Good school results, medium level of self-regulation. We could not consider the motivational level of self-regulation the leading one in this group, so the defects of the first level, the self-regulation of psychic states, were noticeable. Teachers and parents complained that the children were inattentive, it was hard for them to concentrate, and they did not see their mistakes. In spite of good school progress, teachers and parents were sure that the children could achieve better results, if they were more attentive and self-disciplined.

We could say that this situation was quite normal for this age, but high level of hyper-protection, about one fourth of the families in this group, was alarming. It meant that the children did not have enough conditions for developing their self-sufficiency.

Sub-groups A3. Good school results, low level of self-regulation. In this group, we received contradictory results—good progress in studies combined with low level of self-regulation. We could see the lag in development of the frontal lobes of brain in such students—the children showed impulsiveness, elements of “field behavior” and were unable to keep the whole instruction of the correction test.

We got the explanation of that fact when we offered the questionnaire of the family upbringing style to their parents. All the families in this group had hyper-protective style. In every case, we could find an adult, usually a mother or a grandmother, who took the whole responsibility for a child, even in matters in which a child should have been responsible for himself/herself. Everyday they were doing homework together with a child, checking if anything had not been forgotten when a child was going to school etc.. One grandmother even was dressing her eight-year-old granddaughter when a girl did not want to do it herself.

The problem of the families of this group was the parents never thought about developing of self-sufficiency in their children and never did anything in this direction.

Group B. Poor school results, medium and low level of self-regulation. The main problem of the schoolchildren from this group was instability. We could not admit that they were completely unsuccessful at school, but fluctuations of attention complicated their learning and they had the whole range of school marks—from the best to the worst. The students could be successful in certain learning activities, such as a set of simple actions, but failed with a more complicated task due to the lack of concentration. Some schoolchildren, especially boys, often misbehaved. They were quickly exhausted and used passive ways of regulation of their emotional state—behavioral disinhibition or aggression.

Although some families in this group had adequate style of family upbringing, that could not eliminate the

school problems. Other families were using hyper-protective style trying to compensate the defects of self-regulation by means of external regulation.

We think that psycho-correction could be the best solution for such children as functional defects of stem and sub-cortical structures could detain the maturing of the frontal lobes. From the other side, discrepancy between intellectual abilities and poor results of their activities could cause personality conflicts.

Research Findings at the Second Step

At the second step, all the children showed much better results in the neuropsychological tests. That can be explained by functional maturing of brain.

The second change concerned the learning motivation. If in the age of eight to nine years, almost all the children demonstrated high level of it, in the age of 11 to 12, it differed from high to low. They were the consequences of a negative process—when children came to school most of them wanted to learn well and in some years (in our case, they were three), practically half of them lost their interests in school learning. It was not the aim of this research to study the reasons of this phenomenon, we just noted it.

Table 3

*Progress in Learning * Level of Self-regulation Crosstabulation (Three-Year Follow-up)*

		Level of self-regulation			Total
		High	Medium	Low	
Progress in learning	Good	10	6	2	18
	Poor	0	6	6	12
Total		10	12	8	30

As shown in Table 3, the sub-group with high level of self-regulation has increased up to 10 students as a result of maturing of frontal lobes of brain. The sub-groups with good school progress combining with low level of self-regulation decreased from seven to two students. The distribution in the group of students with poor school results also changed: if at the first stage, practically all of them had low level of self-regulation, and at the second stage, half of them had medium level and the other half low one.

Seventeen students showed the same level of self-regulation at both stages. Thirteen students demonstrated positive dynamics: two of them changed the level from low to high, four from medium to high and seven from low to medium.

These changes were compared to the school results and level of self-regulation.

Three students, who changed their learning motivation from high to low, showed low level of self-regulation at both stages. Two of them had poor school results at the first stage and the one having belonged to the group with good school results and low level of self-regulation by the second stage showed worse school results and was reckoned among the group with poor progress in studies.

From nine students who lowered their learning motivation level from high to medium, three had medium level of self-regulation and six had low one. The changes in motivation did have much effect on their school results: just one of them showed better school results at the second stage and the other student showed worse ones, the rest of them had the same rates at both steps.

It must be mentioned that we did not notice worsening of school results of students having showed high level of learning motivation combining with high or medium level of self-regulation at both stages.

Thus, the results of longitudinal study show that for students with high level of self-regulation high level

of learning motivation determines good results of learning activity, in case of medium and low level of self-regulation, the results depend apparently on combination of some other factors.

We have also analyzed the influence of family upbringing on the forming of self-regulation.

From 11 families with adequate style at the first step, six students had the same school results and the same level of self-regulation. Four of them belonged to the sub-groups A1 (good school results, high level of self-regulation), the other two were from the group B (poor school results), one of them had medium level of self-regulation and the other low one. In case of two last mentioned students, even the right family upbringing could not compensate their problems, and they did not improve their school rates. Five students showed higher level of self-regulation in the follow-up, two of them had better school results and were rated as successful.

We could not find any positive dynamics in the families with conniving hyper-protection at both stages—four students remained in the same sub-groups as at the first stage and one showed worse school results and was added to the group with poor school progress.

In some families, we noticed positive changes in the follow-up, and eight students of 10 showed higher level of self-regulation at the second step.

We registered the worst situation with the students whose parents showed lack of self-confidence as a parent and were unsteady in their policy towards a child. One of them (conniving hyper-protection at the first step, unstable family style at the second one) left the sub-groups A3 (good school results, low level of self-regulation) and was reckoned among the sub-groups B3 (poor school results, low level of self-regulation). The other one, whose family had unsteady style at both steps, was having more difficulties with main school subjects and the parents had to hire private tutors to help him/her to cope with school program.

The above-mentioned facts show that the right family upbringing is a necessary but not sufficient condition for forming of conscious self-regulation. In case of uncompensated defects of voluntary self-regulation, the correction should be carried out in two directions—direct to help a child and family therapy, aiming at smoothing problems preventing from development of self-sufficiency in children.

Conclusions

From the above-mentioned, we can conclude as follows:

- (1) The self-regulation of learning activity depends on the maturing of the self-regulation of psychic states, provided by the first block of the brain;
- (2) Some defects of self-regulation of psychic states can be compensated. More serious defects prevent from the maturing of the conscious self-regulation of activity even in the case of safe intellect;
- (3) In the age of eight to nine years begins the adoption of motivation level of self-regulation as the leading one;
- (4) The main compensation actuator of the defects of the self-regulation of psychic states is maturing of motivation level of self-regulation, provided by the third block of brain;
- (5) The style of family upbringing has influence on the maturing of the conscious self-regulation.

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