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Self-regulation as a Mediator in the Relationship between Anxiety and Academic Examination Performance

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Abstract

The research addresses the problem of psychological predictors of academic success. It had the task to scrutinize the relationships of self-regulation, anxiety, and the final examination results on the sample of Russian schoolchildren (N=231). To diagnose regulatory features we used the Morosanova's Self-Regulation Profile Questionnaire (SRPLQM) measuring the students' level of learning activity self-regulation and different regulatory aspects related to achieving academic objectives. To estimate anxiety level the Russian adaptation of Spilberger's Test Anxiety Inventory (TAI) was used. Unified State Exam scores in mathematics and the native language (Russian) had been also collected. Correlation, regression and mediator analysis of individual data made it possible to construct the model revealing a partial mediator effect of the conscious self-regulation in the relationships between the test anxiety and examination success. The study results provide for the main conclusion that the conscious self-regulation acts as a mediator of students' anxiety influence on exam results. The higher the level of conscious self-regulation, the lower the anxiety level and the better exam results.

Keywords: Self-regulation, Test anxiety, Exam performance, Mediator analysis

1. Introduction

For a long time it was believed that cognitive and intellectual abilities development is a prerequisite for academic success. Yet many recent studies have shown an important role of non-cognitive factors for high academic

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achievements, the psychic self-regulation being one of them (Pintrich, DeGroot, 1990; Zimmerman, Schunk, 2001; Zimmerman, Bandura, & Martinez-Pons, 1992; Winne, 1995 and etc.). Scrutinizing the conscious self-regulation of learning activities in the system of academic success predictors is a live issue giving substantial grounds for the sphere of education.

We propose an approach suggesting the conscious self-regulation to be an integrative cognitive-personal construct. On the one hand, it is supposed to be the system of cognitive processes handling information that comprises the Goal planning, Modelling of significant conditions, Programming of actions, Results evaluation. On the other hand, it is presented by singularity of instrumental personal-regulatory features: Flexibility, Independence, Reliability, Responsibility, etc.

This structure of the conscious self-regulation emphasizes its meta-nature as a psychological means of mobilizing and integrating both cognitive and personal resources to solve various problems of vital activity (Morosanova, 2013). We have repeatedly justified the assumption that conscious self-regulation development not only contributes directly, but also mediates the influence of cognitive and personality factors on productive aspects of human activity.

In several studies carried out in Russian schools, we have demonstrated the positive impact of the conscious self-regulation on academic success and performance reliability in the exam situation (Morosanova, Filippova & Fomina, 2014, Morosanova et al., 2016; Morosanova, Fomina & Bondarenko, 2015). It is shown, that self-regulation indicators are linked to various personality characteristics of students, and that the level and the character of this interconnection significantly affect an exam result.

The purpose of the present study was to find an empirical answer to the question: can the conscious self-regulation development not only directly affect the academic success level, but also serve as a mediator of the other psychological characteristics' influence on achievements. Test anxiety was of particular interest to us.

Studying test anxiety and its impact on learning outcomes has a long history. Meta-analysis results show that generally anxiety indicators are negatively related to academic achievements (effect size of $r = -.21$) (Seipp, 1991). Test anxiety is considered as a complex of two elements - cognitive (Worry) and emotional (Emotionality) (Liebert and Morris, 1967; Cassady and Johnson, 2002; Morris, L. W., Davis, M. A., & Hutchings, 1981; Schwarzer, 1984; Zeidner, 1998). Worry is defined as a cognitive component, as understanding disturbing or difficult to explain circumstances, and emotionality - as non-specific reactions caused by arousal of the autonomic nervous system. Their ratio may be different: either priority of the cognitive processes over the heat of passion, or vice versa. The analysis of these components relationship with academic success suggests that worry influences performance to a greater extent (Deffenbacher, 1977; Liebert, R.M. & Morris, 1967).

As the conscious self-regulation involves perceivable processes, we have assumed that primarily it will be related to the cognitive component of anxiety - worry. Therefore, the hypothesis of the study suggests that conscious self-regulation of learning activities through the links to the cognitive component of the test anxiety (worry) acts as a mediator of its impact on exam results.

2. Methods

2.1. Participants

The sample included 231 person (53% males) aged 16-18, educated in the State Secondary Schools in Russia. All participants were in the 11th (out of 11) grade of the Russian formal educational system.

2.2. Measures

To evaluate the regulatory features we used Morosanova's Self-Regulation Profile of Learning Activity Questionnaire (SRPLAQ) measuring the general level of students' learning activity self-regulation and different aspects of self-regulation related to achieving academic objectives. SRPLAQ includes 67 statements describing typical situations of achieving the learning goals. These statements are grouped into the following 9 scales: Planning, Modelling, Programming, Results Evaluation, Flexibility, Independence, Reliability, Responsibility, Social Desirability. Each statement is rated on a scale of 4 (Yes - Probably Yes - Probably No - No). The responses are then reduced to only 'Yes' and 'No', by counting 'probably yes/probably no' as 'yes/no' respectively. The 'yes' responses

are then added up (items are reversed if necessary), so that high scores (maximum 9) denote high self-regulation. In addition, the integrative scale - General level of conscious self-regulation - is also estimated by summing up the scores (maximum 58). SRPLAQ had been previously validated on a sample of 702 students aged 14-18 (Morosanova et al., 2011).

To estimate the test anxiety we used the Russian adaptation of Spilberger's Test Anxiety Inventory (TAI) (Karandashev, Lebedeva, Spilberger, 2004), measuring the worry and emotionality degrees as well as the General anxiety level.

The study also has taken into account the students' Unified State Exam results in two core subjects and used the arithmetical mean of scores in mathematics and native language as a general exam result for each student.

3. Results

The correlation analysis displayed statistically significant positive connections between regulatory indicators and Unified State Exam scores (r= from 0.19 to 0.30, p<0,01), as well as negative connections between regulatory indicators and anxiety level (r= from – 0.17 to -0.24, p<0,01).

Then we conducted a mediator analysis on the basis of regression analysis (Baron, Kenny, 1986) to identify the mediator role of the conscious self-regulation in the final exam performance. For this purpose we successively analyzed the results of several series of regressions between the dependent variable (exam result), the independent variables (worry, emotionality, general anxiety level), and the mediator (General level of conscious self-regulation). In addition, the obtained mediator model was assessed using the Sobel test. The model revealing a partial mediator effect of the conscious self-regulation is presented in Fig. 1.
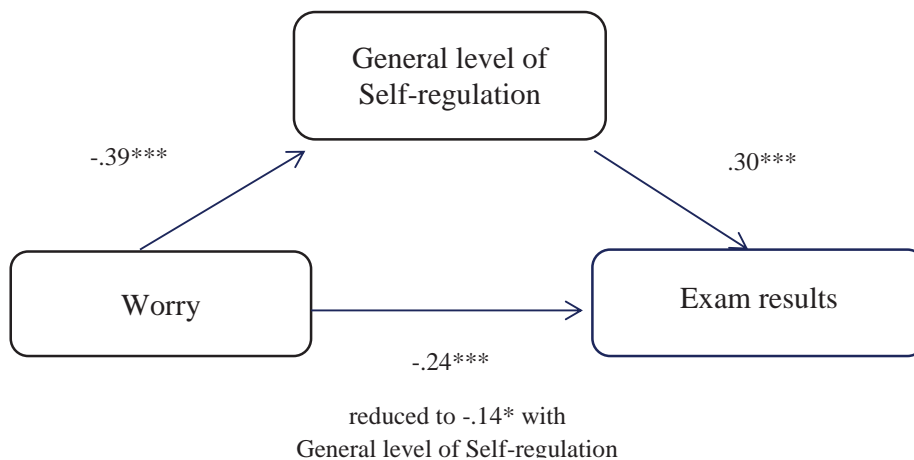

Fig. 1. General level of conscious self–regulation as a partial mediator of the relationship between test anxiety (worry) and exam result

So, the multiple regression analysis indicated that general level of conscious self–regulation was a significant partial mediator of the relationship between worry and exam results. Specifically, the relationship between worry and exam results was significantly reduced from .22 to .16 when General level of self-regulation was included (Sobel's test=-3.05, p=0.002).

Analysis of the resulting model provides for the following:

- the higher the general level of learning activity conscious self-regulation, the lower the student's anxiety level (β = -0.39, p = 0.0000);

- the higher the level of conscious self-regulation, the more successful the exam result (β = 0.30, p = 0.000);

- test anxiety adversely affects examination result;

- control of the mediator - the General level of conscious self-regulation reduces the negative impact of the test anxiety on the exam success.

4. Discussion

Since 2009, in the Russian educational system all the students have to pass the Unified State Exam which serves as both school finals and university entrance examinations. This innovation has led to the fact that many students' exam results due to increased anxiety turn to be lower than assessments made during the learning process. Therefore, in the conditions of Russian educational system modernization there is a social demand for development of students' psychological competencies enabling them to successfully prepare for and pass the examination tests.

In our study we found that students with high anxiety level show the exam results below their annual average performance. These data are consistent with the previously obtained records (Chamorro‐Premuzic & Furnham, 2003; Culler & Holahan, 1980; Seipp, 1991).

In this study we received yet another confirmation of the fact that the conscious self-regulation of learning activity is one of the factors ensuring a positive outcome of the exam. New is the fact that conscious self-regulation not only directly affects the examination results, but also plays a mediator role. In this context it seems to be legitimate that the conscious self-regulation is primarily linked with the worry as a cognitive component of anxiety. We have designed the questionnaire (SRPLAQ) consisting of the scales measuring development of the basic cognitive processes of handling information: Goal planning, Modeling of significant conditions, Programming of actions, Results evaluation.

In our view, the basis for success in the examination test is not just the ability to cope with adverse functional states, but foremost the maturity and stability of the integrated system of conscious self-regulation, which determines the efficiency of setting and achieving educational goals.

5. Conclusions

Conscious self-regulation of learning activity makes a significant contribution to the preparation for examination tests and finally to their results.Conscious self-regulation acts as a mediator in the relationship between the test anxiety of students and examination results.

The mechanisms of conscious self-regulation help to reduce the students' level of anxiety, thereby providing a more effective exam performance and its successful result.

The data obtained in our study have supported the hypothesis about conscious self-regulation mediating the influence of test anxiety level on the students' exam performance. The higher the level of conscious self-regulation, the lower the test anxiety and the better exam results.

Thus, conscious self-regulation of the learning activity plays an important role not only in the effective organization of training, but also in reducing the anxiety influence on exam performance.

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