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Homework Motivation Questionnaire

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Abstract

Introduction. The issue of homework is one of the most acute and relevant for modern schoolchildren, as well as for their parents and teachers. While educators do not doubt the benefits of homework to improve learning skills and foster independence, students often respond with reluctance to complete it. In Russian psychology, there is a lack of diagnostic tools for assessing different types of homework motivation. The aim of this study was to develop a new diagnostic instrument for assessing homework motivation among students in grades 3-11 of secondary schools. **Methods.** The proposed Homework Motivation Questionnaire (HMQ) assesses three characteristic types of motivation – autonomous motivation, introjected motivation, and external motivation; the theoretical foundation of the questionnaire is Self-Determination Theory. To test the validity of the questionnaire on a large sample of students from elementary, middle, and high school (N=1854), measures of satisfaction of basic psychological needs at school, academic performance, perseverance, as well as satisfaction with school, teachers, family, and self were used. **Results.** Analysis of the factor structure and psychometric properties of the questionnaire showed that it is characterized by acceptable indices of internal consistency and a factor structure consistent with theoretical expectations. The validity of the scales is confirmed by correlations with indicators of basic needs satisfaction at school and life satisfaction. The importance of autonomous motivation for perseverance and academic achievement is demonstrated, as well as the dynamics of the three types of homework motivation from elementary to middle and high school among students in mainstream schools.**Discussion.** A new compact homework motivation scale has been developed,

which can be useful both for further research on the role of psychological predictors of homework perseverance and in the practical work of school psychologists to identify adolescents at risk of low academic performance.

Keywords

homework motivation, self-determination theory, questionnaire, validity, reliability, perseverance, academic performance, schoolchildren

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Introduction

The aim of the present study is the development of a homework motivation questionnaire. Survey results from parents, teachers, and students themselves show that the volume of homework constitutes one of the most acute problems for modern schoolchildren, associated with student overload (Arshinskaya, 2014), stress and negative health consequences (Katz et al., 2012; Zhao et al., 2024), a decline in their learning motivation, and growing negative attitudes towards school (Uskova, 2017). Data from international OECD studies on representative samples of fifteen-year-old students indicate that the time spent by Russian adolescents on homework is among the highest among these countries (1st place - China, 2nd place - Russia, 9.7 hours per week, 3rd place - Singapore) (OECD, 2012). Psychological and pedagogical aspects of homework are actively researched and discussed abroad in recent years (Tagunova, 2020; Cooper, 2015), and to a much lesser extent in Russia, which may be related, among other things, to the lack of appropriate Russian-language diagnostic instrument.

To date, the problem of issues of motivation, its types, origins, and consequences has been theoretically, empirically, and methodologically developed within Self-Determination Theory (E. Deci and R. Ryan). The theory is well-applicable to the educational context (Ryan & Deci, 2020). There exist reliable and valid measures for assessing different types of academic motivation in students at different educational levels: elementary

school students (Gordeeva et al., 2020), middle and high school students (Gordeeva et al., 2017). Data obtained with these measures indicate that intrinsic and identified motivation (together forming autonomous motivation) are related to perseverance and academic performance, while controlled external motivation is related to and is a predictor of cheating, reduced well-being, anxiety, and other negative emotions (Gordeeva & Sychev, 2024b; Howard et al., 2021), whereas introjected motivation occupies an intermediate position. These findings are confirmed not only by correlational but also by experimental and qualitative studies of motivation (Katz et al., 2011).

Previous research convinces that information about a student's dominant types of homework motivation will be an important addition to information about their general academic motivation profile. Although homework is part of the overall learning process, its uniqueness lies in the fact that it is done at home, presumably by student alone. Accordingly, the reasons motivating children and adolescents to work in the classroom and at home may differ due to the different contextual environment.

In the international literature, despite dozens of studies dedicated to different types of classroom academic motivation and their consequences (Howard et al., 2021), homework motivation has only recently begun to be studied. Firstly, Katz and her colleagues, based on Self-Determination Theory, developed a homework motivation questionnaire distinguishing two types of motivation – autonomous (the desire to do homework due to interest and understanding its importance for the future) and controlled motivation (motivation driven by external control and pressure from parents and teachers, fear of punishment, as well as personal feelings of shame and a desire to get good grades) (Katz et al., 2011). The questionnaire consists of 19 items; its reliability is shown (Cronbach's alpha equals 0.93 and 0.88 for the two scales, respectively); the scales are not correlated. This questionnaire has been adapted and widely used in China (Liu et al., 2017). Secondly, a short questionnaire of autonomous homework motivation was also used in a study by Nunez et al. (2019).

Research conducted in recent years has shown a link between autonomous homework motivation and less student procrastination in completing homework and higher self-efficacy (Katz et al., 2014), as well as cognitive engagement in its quality completion (Nunez et al., 2019). These results demonstrate that the type of homework motivation is important for success in academic activities.

Methods

Subjects were 1854 students in grades 3-11 from a Moscow school, including 915 girls, 903 boys, and 36 children who did not indicate their gender. The sample comprised 492 (26%) elementary school students, 1074 (58%) middle school students, and 288 (16%) high school students. The average age was 12.51 years, SD = 3.44. The survey was anonymous, participants took part in study voluntarily in their classrooms using paper forms.

We created items for the Homework Motivation Questionnaire (HMQ) relying on the text of similar international instruments (Katz et al., 2011), as well as Russian-language questionnaires for assessing academic motivation in general (Gordeeva et al., 2017). However, considering the data from studies by I. Katz and colleagues (Katz et al., 2010, 2011), where subtypes within controlled motivation were not distinguished, we decided to represent this scale in more detail, distinguishing introjected and external motivation. We assumed that their effects would correspond to the idea of a motivational continuum (Sheldon et al., 2017). Items were developed for autonomous, introjected, and external motivation. Considering the complex composition of autonomous motivation demonstrated in previous research (Gordeeva et al., 2017; Vallerand et al., 1992), items measuring motives to know, self-development motives, and motives related to understanding the importance of learning (identified motives) were included in its structure. The resulting questionnaire along with instructions and response scales is provided in the Appendix.

To analyze the validity of the HMQ, we used a set of instruments measuring basic psychological needs satisfaction at school, academic perseverance.

The Basic Psychological Needs Satisfaction at School Questionnaire (Gordeeva & Sychev, 2024a) was used to assess satisfaction of needs for autonomy, competence, relatedness with teachers and peers, as well as frustration of the autonomy need.

To assess academic perseverance, we used the Academic Perseverance Scale (Gordeeva & Sychev, 2024b).

To assess life satisfaction, we used four scales from the Multidimensional Students' Life Satisfaction Scale: Family, School, Teachers, and Self (Sychev et al., 2018; Huebner, 1994). This scale was administered only to middle and high school students.

We used students' self-reported grades for the past academic quarter in all subjects except physical education to calculate the grade point average (GPA) as an indicator of academic performance.

Data Analysis Methods

Data analysis was conducted using descriptive statistics, confirmatory factor analysis (CFA), correlation analysis, Mann-Whitney U test, and Kruskal-Wallis test. Computations were performed in the R statistical environment, CFA was conducted using the Mplus 8 program (Wang & Wang, 2020). The following indices were considered acceptable (good) for model fit (Mueller & Hancock, 2018): CFI > 0.90 (0.95), RMSEA < 0.08 (0.06), SRMR < 0.08 (0.06). The proportion of participants with missing values in each sample did not exceed 5%. Pairwise deletion was used in correlation analysis. CFA was conducted using the Full Information Maximum Likelihood (FIML) method (Enders & Bandalos, 2001), which provides the most efficient model estimation based on all available observations.

Due to the large sample size and the number of statistical tests performed, we interpreted only the results statistically significant at $p < 0.001$.

Results

In the process of analyzing the factorial structure of the questionnaire we considered four alternative models: 1) a one-factor model; 2) a two-factor model including factors of autonomous and controlled motivation; 3) a three-factor model including factors of autonomous, introjected, and external motivation; 4) a similar three-factor model with added covariances between pairs of items belonging to separate subscales of the autonomous motivation scale. According to CFA results (Table 1), the three-factor model had acceptable fit, and the three-factor model with additional covariances had good fit. The latter model is presented in Figure 1.

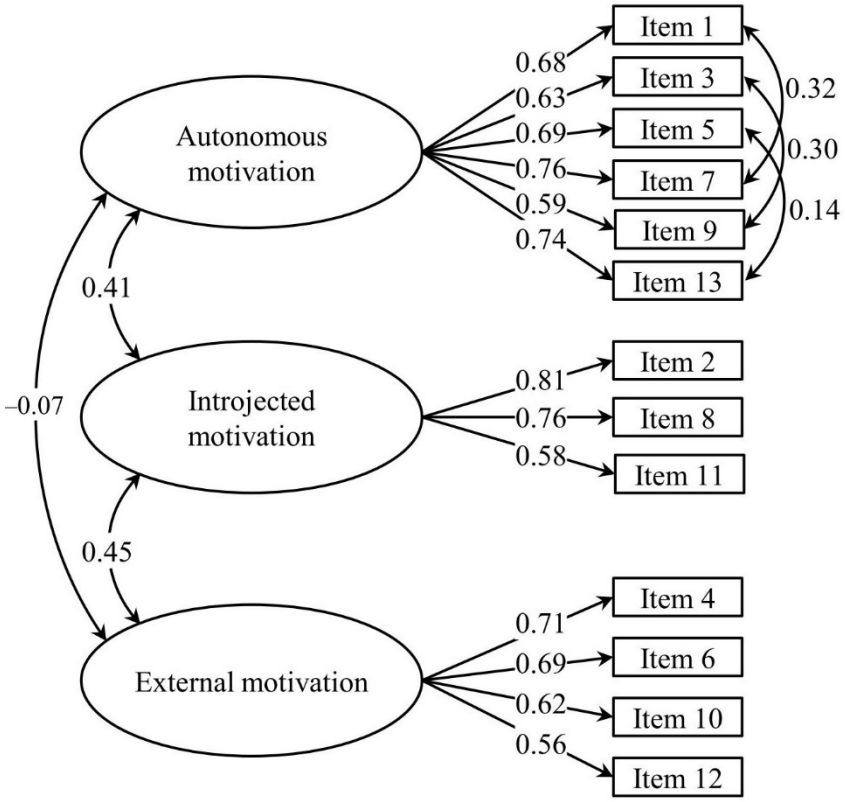
Table 1
Results of Confirmatory Factor Analysis of Alternative HMQ Models

Model	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA [90% CI]
1. 1F	3066.91	65	< 0.001	0.54	0.448	0.149	0.158 [0.153, 0.163]
2. 2F	1606.79	64	< 0.001	0.763	0.712	0.099	0.114 [0.109, 0.119]
3. 3F	597.22	62	< 0.001	0.918	0.897	0.049	0.068 [0.063, 0.073]
4. 3FC	334.45	59	< 0.001	0.958	0.944	0.043	0.050 [0.045, 0.055]

Notes. Models: 1F — one-factor, 2F — two-factor, 3F — three-factor, 3FC — three-factor model with pairwise item covariances. CFI — comparative fit index, TLI — Tucker-Lewis index.

Figure 1

Structural Model of the HMQ (all coefficients shown are statistically significant at p < 0.05; residuals omitted for clarity).



Thus, the expected scales and subscales of the questionnaire was confirmed by the CFA results. The internal consistency of scales and subscales was acceptable across all age groups (see Table 2).

Table 2

Internal Consistency Coefficients (Cronbach's Alpha) of HMQ Scales in Different Samples

Scales and subscales of HMQ	The whole sample (N = 1848)	Elementary school (N = 489)	Middle school (N = 1071)	High school (N = 288)
Main Scales of HMQ				
Autonomous motivation	0.85	0.84	0.84	0.85
Introjected motivation	0.75	0.75	0.73	0.79
External motivation	0.74	0.74	0.74	0.70

Scales and subscales of HMQ	The whole sample (N = 1848)	Elementary school (N = 489)	Middle school (N = 1071)	High school (N = 288)
Subscales of autonomous motivation				
Motivation to know	0.80	0.82	0.79	0.71
Self-development motivation	0.78	0.76	0.78	0.78
Identified motivation	0.76	0.73	0.74	0.77

Descriptive statistics for the HMQ scales and their correlations with other indicators are presented in Table 3. Correlations of HMQ scales with GPA proved the productive nature of autonomous and introjected motivation, while no association between GPA and external motivation was discovered. Differences in the effects of various motivation types are more pronounced with respect to perseverance: its correlation with autonomous motivation is strong, with introjected motivation — weak, and with external motivation — weak and negative. We also obtained the expected correlations of motivation scales with satisfaction/frustration of basic needs and with life satisfaction indicators.

Table 3
Descriptive Statistics and Correlations of HMQ Scales with Other Variables

Scales	*N*	Scales of HMQ		
		Autonomous motivation	Introjected motivation	External motivation
GPA	1779	0.23*	0.14*	–0.04
Perseverance	1842	0.69*	0.20*	–0.14*
Autonomy need satisfaction	1848	0.38*	0.04	–0.20*
Autonomy need frustration	1848	–0.38*	–0.01	0.25*
Competence need satisfaction	1848	0.51*	0.14*	–0.10*
Relatedness need satisfaction (teachers)	1848	0.49*	0.19*	–0.06
Relatedness need satisfaction (peers)	1848	0.33*	0.05	–0.18*
MSLSS Family	1337	0.37*	0.04	–0.30*

Scales	*N*	Scales of HMQ		
		Autonomous motivation	Introjected motivation	External motivation
MSLSS School	1337	0.66*	0.17*	−0.21*
MSLSS Teachers	1337	0.56*	0.19*	−0.15*
MSLSS Self	1337	0.33*	0.01	−0.26*
Mean	1854	3.55	3.08	2.66
Standard deviation	1854	0.96	1.20	1.13
Skewness	1854	−0.48	−0.07	0.33
Kurtosis	1854	−0.38	−0.99	−0.86

Notes. *Statistical significance: * — $p \le 0.001$. Correlations with subscales of autonomous motivation are not given due to their redundancy and similarity to correlations for the autonomous motivation scale.*

Analysis of differences between boys and girls (Table 4) revealed that boys had higher external motivation, while no differences were found for other motivation types.

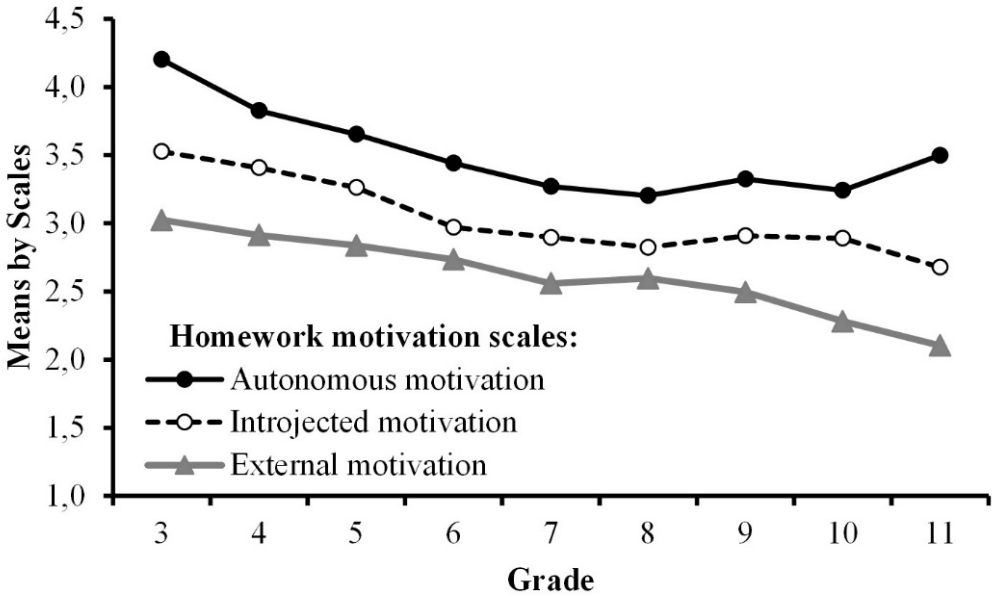
Table 4
Differences in HMQ Scale and Subscale Scores Between Boys and Girls

Scales and subscales of HMQ	Means		Standard deviations		*Cohen's d*	*Mann–Whitney U test*	*z(U)*	*p*
	Girls	Boys	Girls	Boys				
Autonomous motivation	3.54	3.57	0.93	0.98	0.04	401284.5	1.06	n.s.
Introjected motivation	3.13	3.04	1.19	1.20	0.08	431427.5	1.73	n.s.
External motivation	2.50	2.83	1.10	1.14	0.30	342111.5	6.29	<0.001
Motivation to know	2.91	3.01	1.17	1.23	0.09	391422	1.88	n.s.
Self-development motivation	3.81	3.85	0.99	1.02	0.03	399390	1.12	n.s.
Identified motivation	3.86	3.78	1.02	1.09	0.08	426382.5	1.19	n.s.

Notes. *n.s. — not significant.*

Comparison of motivation scales across age groups by grade (Figure 2) showed that all three types of motivation decline with age, although autonomous motivation became more stable in high school and even showed a slight upward trend in grade 11.

Figure 2
Homework Motivation Indicators Across Different Age Groups (by Grade).



Statistically significant differences between grades in the level of autonomous motivation were found using the Kruskal-Wallis test: $H(8)=202.61$; $p < 0.001$. Similarly, significant age differences were revealed by introjected ($H(8)=91.82$; $p < 0.001$) and external motivation ($H(8)=95.74$; $p < 0.001$).

Discussion

Given the significance of the homework problem in modern children, a Homework Motivation Questionnaire applicable to schoolchildren starting from elementary school age has been developed. The questionnaire aims to diagnose three types of motivation – autonomous, introjected, and external. The presented data testify to its reliability and validity; thus, it can be used with students of different age groups.

The results of the study confirmed the suitability of the proposed scale for assessing homework motivation in schoolchildren, starting from the third grade, i.e. 8-9 years old. They indicate acceptable internal consistency of the scale and the expected factor structure. Evidence of the scale's validity, also illustrating the importance of considering different types of homework motivation, are the discovered moderate yet highly

significant correlations with the average grade point. The most convincing evidence of validity are the obtained correlations of the scales with academic perseverance, which determines its effectiveness. The validity of the proposed scale is also confirmed by its links with indicators of basic psychological needs satisfaction at school and frustration of the need for autonomy. Expected links with life satisfaction indicators also testify to the validity of the scales.

All three types of motivation decrease with higher grade levels; although autonomous motivation shows a tendency to increase in grade 11, which may be related to the selection factor which in common for Russian schoolchildren when transitioning to high school. The data on the decline of autonomous homework motivation in middle grades align well with data obtained by Katz and her colleagues, who found a decrease in autonomous homework motivation from grade 4 to grade 8 among Israeli schoolchildren, which was also associated with a less positive perception of teachers as being less supportive of basic psychological needs (Katz et al., 2010). This is also consistent with data on the age-related decline in intrinsic motivation, interest, and perceived utility of homework in Spanish schools (Regueiro et al., 2015) and Chinese schools (Hong et al., 2009). The discovered pattern itself is of substantial interest and requires further research. The decline in autonomous motivation may be a cause of declining academic performance, which is also related to the general decrease in academic motivation. We assume that this result is largely related to the teaching methods and programs used, teachers' interaction styles with students, and the feedback they provide.

It is shown that external motivation is more pronounced in boys, which indicates that they feel more pressure from parents and may correspond to their lower academic achievements in most school subjects, except for mathematics (Tikhomirova & Malykh, 2023; Chertkova & Pyankova, 2014). The possible subject-specific nature of these gender differences is evidenced by the fact that in a study of Chinese students, boys were characterized by more pronounced autonomous motivation for doing mathematics homework (Feng et al., 2019).

The proposed measure provides broad opportunities for further research on students' academic motivation, causes of their underachievement, and unproductive academic behaviors, including cheating. The developed questionnaire will allow Russian researchers in the fields of motivation psychology and educational psychology to investigate the different types of schoolchildren's homework motivation as a predictor of their academic success, as well as to study various environmental and educational factors influencing it, including the role of teachers and parents.

A limitation of the study is the absence of concurrent validity indicators, which is due to the lack of alternative Russian-language tools for assessing homework motivation. The relationship between homework motivation and general academic motivation may be of interest and represents a direction for future research.

Conclusions

As a result of the conducted research, based on modern developments in the psychology of motivation, namely self-determination theory, a compact instrument for assessing homework motivation among students in grades 3-11 of secondary schools has been proposed. The developed instrument assesses three most characteristic types of motivation — autonomous, introjected, and controlled, each of which has its own associations with perseverance, academic achievement, and indicators of satisfaction with learning activities.

The questionnaire has a theoretical foundation, i.e. Self-Determination Theory, builds upon previous developments in this direction, and is characterized by acceptable levels of internal consistency and a factor structure consistent with theoretical concepts. Evidence supporting the validity of the questionnaire has been obtained, convincingly demonstrating the importance of autonomous homework motivation for perseverance and academic achievement in samples of both middle/high school and elementary school students.

The questionnaire may be useful to researchers studying motivation and academic achievement. The questionnaire can be also useful for school psychologists to identify students at high risk of low academic achievement, as well as to assess the effectiveness of new pedagogical approaches to homework.

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Appendix

Homework Motivation Questionnaire (HMQ)

Please read the statements carefully and mark the answer that suits you best. Use the following scale for your responses: 1 = False (NO), 2 = Rather false, 3 = Neither true nor false, 4 = Rather true, 5 = True (YES)

I do my homework because...

	1	2	3	4	5
1. I enjoy doing lessons.					
2. I would be ashamed if I didn't do them.					
3. I feel I am developing by solving challenging tasks.					
4. Otherwise, I will have problems with my parents.					
5. It will help me succeed in school.					
6. I don't want to be scolded by my parents.					

	1	2	3	4	5
7. I love learning.					
8. I am ashamed to get bad grades.					
9. I like knowing and being able to do more and more.					
10. I am not allowed to do anything else until they are done.					
11. I feel guilty for not doing it.					
12. I have no choice; I must do it.					
13. It will help me in the future to become who I want to be.					

Scoring Key:

Autonomous motivation: items 1, 3, 5, 7, 9, 13.

Introjected motivation: items 2, 8, 11.

External motivation: items 4, 6, 10, 12.

For a more detailed analysis, subscales of the autonomous motivation scale can be used: motivation to know — items 1, 7; self-development motivation — 3, 9; identified motivation — 5, 13.

Author Contributions

Tamara O. Gordeeva – research idea, conceptualization, questionnaire development, data collection, Introduction, Discussion, Conclusion.

Oleg A. Sychev – questionnaire development, data analysis, Methods, Results, Discussion.

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Conflict of Interest Statement

The authors declare no conflict of interest.