

New Perseverance Scale for Adolescents: Its Development and Testing

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The study presents a new questionnaire Perseverance Scale for Adolescents. It was developed on the Russian context and represents perseverance multidimensionality. The Perseverance Scale contains three subscales: Perseverance in achieving goals, Perseverance in overcoming difficulties, and Inappropriate Persistence. Adolescents from different regions of the Russian Federation were recruited for the study (N=1,718; age from 12 to 18 years; average age 14 ± 1 years; 53,8% female). Confirmatory factor analysis showed a good fit of the three-factor model to the data (GFI=0,95; IFI=0,94; CFI=0,94; SRMR=0,048; RMSEA=0,078 [0,072; 0,083]). The validity of the Perseverance Scale is confirmed by the expected correlations with the subscales of the “Multidimensional Students’ Life Satisfaction Scale” (MSLSS) and “Multidimensional School Engagement Scale”. The validity of the New Perseverance Scale is also verified by the differences obtained between groups of students with different academic achievements. We have noticed higher rates of perseverance in achieving goals and perseverance in overcoming difficulties among well-performing students. There was no difference in Inappropriate Persistence. The Perseverance Scale can be used for individual research to assist in psychological practice.

Keywords: perseverance; persistence; Perseverance Scale; Perseverance in achieving goals; Perseverance in overcoming difficulties; Inappropriate persistence; Grit; adolescents; academic success.

Funding. The study was carried out within the framework of the state assignment of the Ministry of Education of the Russian Federation dated 02/09/2024 No. 073-00037-24-01 “Development of a standardized psychodiagnostic tools package in digital format for assessing the individual psychological characteristics of students at different levels of education”.

Acknowledgements. The authors are grateful to O.I. Leonova, the Head of the Federal Center for Scientific and Methodological Support of the Pedagogical Staff, and L.M. Prokopyeva, the Head of the Professional Education Quality Monitoring Department, for assistance in collecting data.

For citation: Odintsova M.A., Radchikova N.P. New Perseverance Scale for Adolescents: Its Development and Testing. *Psikhologicheskaya nauka i obrazovanie = Psychological Science and Education*, 2024. Vol. 29, no. 6, pp. 129—144. DOI: <https://doi.org/10.17759/pse.2024290609> (In Russ.).

Шкала настойчивости для подростков: разработка и апробация нового инструмента

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Представлена апробация новой методики «Шкала настойчивости» для подростков, отражающей многоаспектность данной категории. Шкала настойчивости содержит три субшкалы: настойчивость в достижении целей, настойчивость в преодолении трудностей, неуместная настойчивость. Апробация проведена на выборке подростков из разных регионов Российской Федерации (N=1718; возраст — от 12 до 18 лет; средний возраст — 14 ± 1 лет; 53,8% женского пола). Конфирматорный факторный анализ показал хорошее соответствие трехфакторной модели данным (GFI=0,95; IFI=0,94; CFI=0,94; SRMR=0,048; RMSEA=0,078 [0,072; 0,083]). Валидность Шкалы настойчивости подтверждается ожидаемыми корреляционными связями со шкалами методик «Шкала удовлетворенности жизнью» (ШУДЖИ) и «Многомерная шкала школьной вовлеченности». О валидности Шкалы настойчивости говорят и полученные различия между группами учеников с разной успеваемостью: более высокие показатели настойчивости в достижении цели и настойчивости в преодолении трудностей у хорошо успевающих учеников. Различий по неуместной настойчивости не выявлено. Шкала настойчивости может быть использована для индивидуальных исследований для выстраивания практики психологической помощи.

Ключевые слова: настойчивость; упорство; Шкала настойчивости; настойчивость в достижении целей; настойчивость в преодолении трудностей; неуместная настойчивость; Grit; подростки; академическая успешность.

Финансирование. Исследование выполнено в рамках государственного задания Министерства просвещения Российской Федерации от 09.02.2024 № 073-00037-24-01 «Разработка пакета стандартизированного психодиагностического инструментария в цифровом формате для оценки индивидуально-психологических особенностей обучающихся на разных уровнях образования».

Благодарности. Авторы благодарят за помощь в сборе данных руководителя научно-методического центра сопровождения педагогических работников О.И. Леонову и начальника отдела мониторинга качества профессионального образования Л.М. Прокопьеву.

Для цитаты: Одинцова М.А., Радчикова Н.П. Шкала настойчивости для подростков: разработка и апробация нового инструмента // Психологическая наука и образование. 2024. Том 29. № 6. С. 129—144. DOI: <https://doi.org/10.17759/pse.2024290609>

Introduction

The development of perseverance plays a crucial role during adolescence — a period characterized by rapid changes in physiological, social, emotional, and cognitive domains — amid increasing stress, declining academic performance, and other challenges. The concept of perseverance is complex, retaining its significance over many years while remaining highly debated. In the past decade, the concept of *Grit*, introduced by Duckworth, has gained widespread recognition. *Grit* is considered a non-cognitive personality trait characterized by perseverance of effort and constancy of interests, contributing to personal achievements in professional and educational activities regardless of intellectual abilities [18, 19].

Attempts have been made to analyze constructs that are similar to and closely overlap with *Grit*, such as conscientiousness [26] and persistence [21]. Erofeeva and Nartova-Bochaver, exploring the semantic nuances of *Grit* and the meaning of perseverance embedded in Rubinstein's works, concluded: 'It is the Russian word perseverance that best reflects the content of the Grit construct' [4, p. 23].

In Russian psychology, perseverance is interpreted as a systemic personality trait within the framework of Krupnov's system-functional model. It consists of:

1. A motivational-semantic component, including attitudinal-goal, motivational, cognitive, and productive subcomponents; and
2. An instrumental-dynamic component, encompassing dynamic, emotional, regulatory, and reflexive-evaluative features [6].

These components collectively ensure a stable desire to implement decisions, achieve long-term goals, maintain sustained activity, engage in targeted self-regulation, and demonstrate reasonable persistence in the face of obstacles [1, 13].

Perseverance is also considered a special personal resource that reliably protects against burnout and reduces fatigue in schoolchildren [33]. It also enhances engage-

ment and academic performance [30, 31], provides protection against stressors [22], anxiety, and depression [23], increases subjective well-being [36], predicts the growth of intellectual abilities [37], etc. Classified as a mental resource [7], perseverance enables individuals to actively express themselves in various types of activities. In contemporary research, particular attention is paid to the dependence of academic performance on perseverance. It has been established that adolescents with higher levels of perseverance achieve better academic outcomes [27, 30, 31]. A cross-cultural meta-analysis [25] including 137 studies with 156 independent samples (N = 285,331) showed a relationship between the general perseverance indicator and academic achievements. Furthermore, motivational sources of perseverance have been discovered [3].

It has been noted both in Russian [1, 7] and foreign [21] literature that virtually any human characteristic can have negative consequences under certain circumstances. In this context, Russian psychological literature introduces the concept of hypertrophied perseverance (getting stuck on a task, unwillingness to take into account the positions of others, working to the detriment of one's health) [1], and foreign psychology refers to inappropriate perseverance (perseverance in achieving a meaningless or futile goal). Failing to recognize inappropriate persistence not only wastes time and resources on a doomed activity but also leads to psychological disorders [21].

In the model of cognitive-behavioral self-transforming character activity, the following aspects are identified: *I want* (motivation, meanings, and goals); *I can* (the productivity of activity); *I act* (the transformative nature of activity aimed at achieving a useful result) [9]. However, the *must* component, which reflects mature forms of behavior, persistence in achieving a goal and overcoming internal and external obstacles, is lost. This was noted by Ushinsky, 'If a person who is amazed at the ingenuity of a genius could look at the process

of these inventions, he would be amazed not at the mind, but at the willpower, passion, and perseverance of the inventor' [12, p. 428]. Thus, perseverance can be considered as a mental resource

Thus, perseverance can be considered as a mental resource that includes motivational-semantic (the persistent pursuit of a meaningful goal) and instrumental-dynamic (active overcoming of external and internal barriers) components that ensure long-term, steady, directed activity and reasonable persistence to achieve a useful result.

Many psychodiagnostic instruments have been developed to measure perseverance. The most popular are *Grit* [18] and *Grit-S* [19] scales, used in different countries and adapted in Russia [34]. However, as studies have shown, the *Grit Scale* does not always work well in collectivist cultures [17], and its structure remains unclear [34, 35]. Therefore, attempts have been made to either expand this construct or to find alternatives. Let us mention just a few of these:

1. *Persistence Scale* (PS-20) (Poland) [29] includes 20 items and a single scale. Persistence is considered as a resource associated with adaptive behavior, mental stability, and self-regulation of the individual.

2. *Multidimensional Persistence Scale* (MPS) (USA) [21] consists of 13 main items, three subscales (*Persistence Despite Difficulty* (PDD), *Persistence Despite Fear* (PDF), and *Inappropriate Persistence* (IP)), as well as an additional subscale, *Goal Time Preference Scale* (GTP). This instrument was created through a three-study process based on the factor structure.

3. *Grit Psychological Resources Scale*, GPRS (Australia) [28] was developed based on the analysis of Duckworth's works and the constructs similar to *Grit*. It identifies several psychological resources of perseverance, including stability of interests, persistence in achieving goals, persistence in overcoming difficulties, life engagement, hope for success, and others. The scale consists of 20 points corresponding to four resources (*Passion, Persistence, Life Engagement, and Hope*).

4. *Triarchic Grit Scale* (TMG) for high school students (Philippines) [17] includes 10 items and three subscales, two of which (*Perseverance of efforts* and *Consistency of interests*, four items each) were taken from *Grit-S*. The third subscale, *Adaptability to situations*, was added by the authors. It characterizes the acceptance of changes, flexibility, and the desire to overcome difficulties as they arise.

5. *Three-dimensional Grit Scale* (India) (3-D Grit Scale) [24] includes 17 items and three subscales: *Perseverance-Commitment*, PC (long-term goal-oriented behavior); *Interest-Passion*, IP (the level of passion and intrinsic motivation concerning goals), and *Goal-directed Resilience*, GR (an individual's ability to recover from the setbacks associated with pursuing long-term goals).

6. *Perseverance Test* by Krupnov (eight forms and 112 items) [6].

7. *Perseverance questionnaire* by Ilyin and Feshchenko (18 items and one scale) [5].

8. *The Questionnaire of Grit and Stability of Learning Interests* by Gizhitsky, Gordeeva, and Gavrichenkova (includes only six items of Duckworth *Grit* subscale *Persistence of Effort*) [2].

9. *Volitional Personality Traits Questionnaire* for adolescents by Chumakov (83 items, nine subscales, one of which is *Persistence*) [15].

The questionnaires developed in Russia to measure persistence/perseverance are either too long [6], measure only a single aspect of persistence [2], are part of the structure of the volitional personality traits framework [15], or have not undergone psychometric testing [5].

Thus, numerous persistence/perseverance scales have been developed around the world, some of which are aimed at adolescents. Some instruments reflect a single perseverance scale [2, 5, 18, 29], but most have a multi-component structure [6, 14, 17, 21, 24, 28]. In recent years, the main characteristics of perseverance have been identified and summarized: perseverance in achieving goals; stability of interest (passionate absorption in the activity); perseverance in achieving success; tenacity in overcoming difficulties,

as well as inappropriate persistence (meaninglessness and uselessness of efforts). However, a psychodiagnostic instrument that allows for measuring all these characteristics has not been developed. Such an instrument is especially important for adolescents, whose perseverance largely determines the success of self-actualization across various activities [22, 23, 27, 30, 31, 32, 37]. This encouraged us to develop a new scale for measuring perseverance in adolescents, which initially included 20 items and five subscales (four items each). These subscales reflect the multidimensional nature of perseverance: *Perseverance in achieving goals*; *Stability of interests*; *Perseverance in overcoming difficulties*; *Perseverance in achieving success*, and *Inappropriate persistence*. The process of creating a new scale involved multiple stages and was built on the basis of previous studies and experts' work (N = 30), who formulated items reflecting five criteria of perseverance, selected statements from folklore, and conducted two pilot studies. After each study, the wording of the items was adjusted taking into account participants' feedback. The resulting *Perseverance Scale* is not an adaptation of a ready-made foreign questionnaire; it includes some statements from folk wisdom on persistence and two statements of the subscale of *Inappropriate persistence* from the *Multidimensional Persistence Scale* [21]. Thus, the purpose of this study was to test the new *Perseverance Scale* for adolescents aged 12–18 years.

Method

Participants. The study involved 1,718 adolescents from different regions of the Russian Federation aged 12 to 18 years (53.84% female). The average age was 14 ± 1 years (median = 14 years). The respondents were divided into three age groups: 12-13 years (N1 = 673), 14-15 years (N2 = 718), and 16-18 years (N3 = 327).

Research instruments. The initial version of the *Perseverance Scale* had 20 items that were supposed to make up five subscales, but exploratory factor analysis showed that

only three scales could be identified (three factors had eigenvalues greater than one and explained 53% of the total variance), and not all items were included in the identified factors with significant loadings. As a result, three subscales with four items each were left: *Perseverance in achieving goals*, *Perseverance in overcoming difficulties*, and *Inappropriate persistence*. Contrary to our expectations, *Stability of interests* and *Perseverance in achieving success* were not identified as separate subscales. This may be due to the following: in the first case, the subscale *Stability of interests* might not relate directly to perseverance as a psychological construct [16], and in the second case, cultural values may contribute. Thus, a systematic review of adolescent concepts of success showed that Russian adolescents most strongly associate success with goal achievement, feeling proud of their efforts, the fulfillment of their talents, and the ability to overcome obstacles, suggesting that success is the result of hard work and effort [20]. The appropriateness of identifying three subscales also corresponds to Krupnov's system-functional model [6], in which the category of inappropriate persistence is identified [21], as well as the following categories: 1) persistence/perseverance, which includes such characteristics as an active attitude to work, striving for a set goal, and inner strength to overcome obstacles, and 2) stubbornness: childish forms of behavior (capriciousness, negativism, and meaninglessness) [11]. The final text of the *Perseverance Scale* with keys is given in Appendix 1.

To test external validity, the *Multidimensional Satisfaction with Life Scale* (MSLSS) [10], the *Multidimensional Scale of School Engagement* [14], and a questionnaire containing questions on age, gender, place of residence, and academic performance ("I have mostly A's / mostly B's / mostly C's") were used. Respondents were divided by their academic performance as follows: high, mostly A's (N1 = 448); average, mostly B's (N2 = 899); low, mostly C's (N3 = 360).

Procedure. The data were collected using specially designed forms implemented

in the Anketolog system. Participation in the study was anonymous and voluntary. Written consent was obtained from the adolescents' parents in advance. The data collection procedure took approximately 20 minutes. The data are presented in the repository of psychological research and tools of the Moscow State University of Psychology & Education, RusPsyDATA [8].

Statistical analysis included descriptive statistics; confirmatory factor analysis (CFA) and Cronbach's alpha calculation to assess the internal consistency and structure of the questionnaire. Correlation analysis and ANOVA were conducted to test external validity. CFA was performed in Amos SPSS, while other calculations were conducted in STATISTICA.

Results and Discussion

Internal consistency. Confirmatory factor analysis showed a good fit of the three-factor model to the data: $GFI = 0.95$; $IFI = 0.94$; $CFI = 0.94$; $SRMR = 0.048$; $RMSEA = 0.078$ [0.072; 0.083]; $AIC = 634.27$; $BIC = 781.39$. At the same time, it was noted that factors 1 and 2 are closely related to each other (Fig. 1), which gives grounds for assuming a two-factor model in which factors 1 and 2 (*Perseverance in achieving goals* and *Perseverance in overcoming difficulties*) can be combined into one. However, the two-factor model showed a worse fit: its fit indices were lower, and the AIC and BIC coefficients were higher ($GFI = 0.94$; $IFI = 0.93$; $CFI = 0.93$; $SRMR = 0.049$; $RMSEA = 0.079$ [0.074; 0.085]; $AIC = 676.17$; $BIC = 812.39$). This result, as well as the structure of age differences (see below in the section *Gender and age differences*), indicate that it is appropriate to distinguish three aspects of perseverance. The three-factor structure appeared to be invariant to gender and age (Appendix 2).

Descriptive statistics and internal consistency indices (Cronbach's alpha) for all subscales of the questionnaires used are presented in Table 1. The internal consistency of all subscales of the *Perseverance Scale* is satisfactory to good, with Cronbach's alpha

values ranging from 0.68 to 0.85. Correlations between subscales 1 and 2 with subscale 3 are low ($r = 0.39$ and $r = 0.42$, respectively), while a strong relationship is observed between subscales 1 and 2 ($r = 0.76$). These results align with the confirmatory factor analysis (CFA) findings (Fig. 1).

External validity. To evaluate the scale's validity, correlations were calculated between the subscales of the *Perseverance Scale* and the subscales of the *Multidimensional Students' Life Satisfaction Scale* (MSLSS) and the *Multidimensional School Engagement Scale*. The results (Table 2) indicate that the subscales *Perseverance in Achieving Goals* and *Perseverance in Overcoming Difficulties* exhibit the strongest correlations with satisfaction across various life domains and school engagement.

Gender and age differences. A two-way ANOVA with *Gender* and *Perseverance Scale subscales* as factors did not reveal statistically significant differences by gender. Both the main effect of *Gender* and its interaction with *Perseverance Scale subscales* were not significant ($F(1, 1716) = 2.72$; $p = 0.10$; $\eta^2 = 0.002$ and $F(2, 3432) = 2.99$; $p = 0.051$; $\eta^2 = 0.002$, respectively). Thus, it can be concluded that adolescent girls and boys do not differ in perseverance scores.

A similar analysis was conducted to examine age-related changes in perseverance. Results indicated that perseverance increased with age (main effect $F(2, 1715) = 6.04$; $p = 0.002$; $\eta^2 = 0.01$), although the effect was small. The interaction effect was more pronounced ($F(4, 3430) = 18.06$; $p < 0.0001$; $\eta^2 = 0.02$), indicating that different components of perseverance changed differently across age groups (Fig. 2). Tukey's post hoc test revealed that for 12—13-year-olds, all perseverance indicators significantly differed: *Perseverance in Overcoming Difficulties* was statistically significantly higher than *Inappropriate Persistence* ($p = 0.0028$), and *Perseverance in Achieving Goals* was statistically significantly higher than *Perseverance in Overcoming Difficulties* ($p = 0.0002$). For adolescents aged 14—15 and 16—18, the

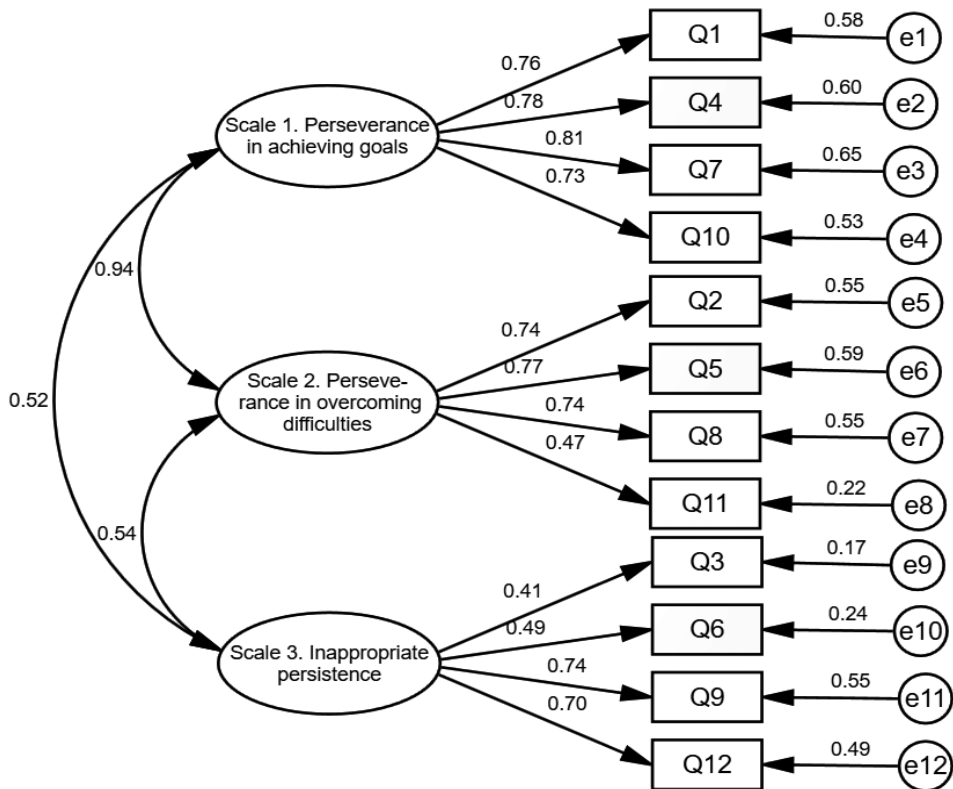


Fig. 1. Confirmatory factor analysis results: weight coefficients for the three-factor model
 ($GFI = 0.95$; $IFI = 0.94$; $CFI = 0.94$; $SRMR = 0.048$; $RMSEA = 0.078$ [0.072; 0.083])

Table 1

Descriptive statistics and internal consistency of questionnaire subscales

Scales	M ± s	Me [LQ; UQ]	α
Perseverance Scale			
Scale 1. Perseverance in achieving goals	19.4 ± 5.0	20 [16; 23]	0.85
Scale 2. Perseverance in overcoming difficulties	18.9 ± 4.6	19 [16; 22]	0.77
Scale 3. Inappropriate persistence	17.3 ± 4.3	17 [15; 20]	0.68
Multidimensional Students' Life Satisfaction Scale (MSLSS)			
Family	23.8 ± 5.2	25 [20; 28]	0.88
School	19.1 ± 5.1	19 [16; 23]	0.85
Teachers	20.6 ± 5.5	21 [17; 25]	0.90
I myself	22.6 ± 5.1	23 [19; 27]	0.88
Friends	25.3 ± 4.8	27 [23; 29]	0.89
Multidimensional School Engagement Scale			
Behavioral Engagement	13.7 ± 3.4	14 [11; 16]	0.76

Scales	M ± s	Me [LQ; UQ]	α
Cognitive Engagement	18.8 ± 4.1	19 [16; 22]	0.83
Emotional Engagement	18.5 ± 4.1	19 [16; 22]	0.81
Social Engagement	18.6 ± 4.2	19 [16; 22]	0.80
Behavioral Indifference	15.0 ± 6.5	13 [10; 19]	0.90
Cognitive Indifference	4.2 ± 1.9	4 [3; 5]	0.64
Emotional Indifference	10.0 ± 4.1	10 [7; 13]	0.84
Social Indifference	7.6 ± 3.4	7 [4; 10]	0.79

Note: M, mean; s, standard deviation; Me, median; LQ, lower quartile; UQ, upper quartile; α, Cronbach's alpha

Table 2

Pearson correlation coefficients between the subscales of the Perseverance Scale and the subscales of MSLSS and the Multidimensional School Engagement Scale

Subscales	Perseverance Scale		
	Scale 1. Perseverance in achieving goals	Scale 2. Perseverance in overcoming difficulties	Inappropriate persistence
Multidimensional Students' Life Satisfaction Scale (MSLSS)			
Family	0.47**	0.40**	0.14**
School	0.42**	0.40**	0.06*
Teachers	0.43**	0.42**	0.11**
I myself	0.53**	0.42**	0.14**
Friends	0.43**	0.36**	0.12**
Multidimensional School Engagement Scale			
School Engagement			
Behavioral	0.50**	0.48**	0.15**
Cognitive	0.56**	0.56**	0.20**
Emotional	0.49**	0.46**	0.16**
Social	0.51**	0.46**	0.17**
School Indifference			
Behavioral	-0.41**	-0.39**	-0.05*
Cognitive	-0.43**	-0.41**	-0.05*
Emotional	-0.34**	-0.30**	0.03
Social	-0.38**	-0.32**	-0.03

Note: ** p < 0,01; * p < 0,05.

indicators of *Perseverance in achieving goals* and *Perseverance in overcoming difficulties* do not differ significantly ($p = 0.28$ and $p = 0.52$, respectively). However, scores for *Perseverance in Overcoming Difficulties* increased significantly with age, rising from approximately 18 points at ages 12–13 to 19 points at ages 14–15, and 20 points at ages 16–18. Changes in *Perseverance in Overcoming Difficulties* were the most substantial

(approximately 2 points), followed by changes in *Perseverance in Achieving Goals* (approximately 1.5 points). Conversely, changes in *Inappropriate Persistence* were negligible, statistically insignificant, and fluctuated within 0.5 points. Norms for all subscales of the *Perseverance Scale* across different age groups are provided in Appendix 3.

Correlation with academic performance. Prior studies [3, 22, 25, 27, 30, 31, 32] sug-

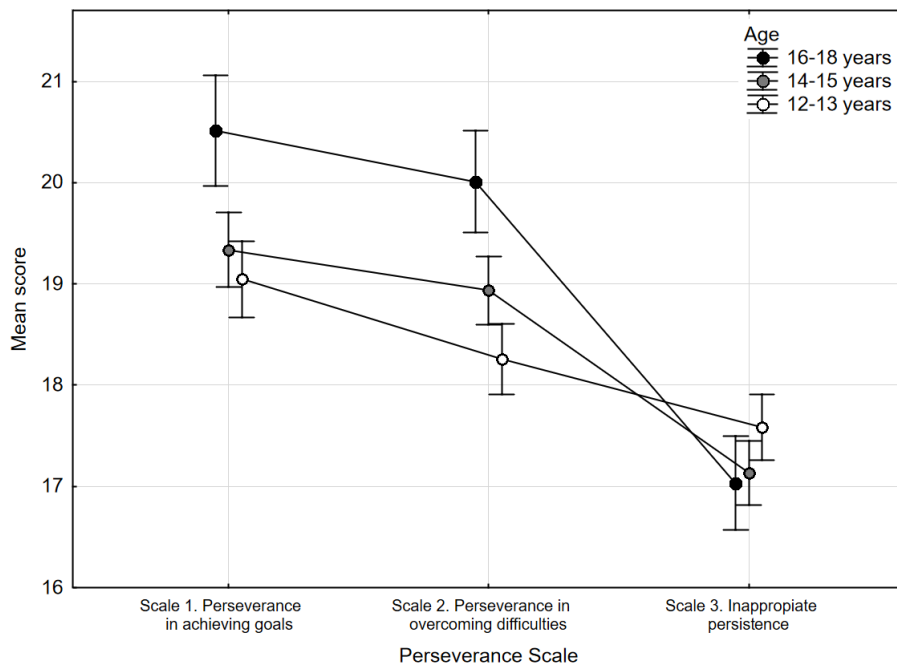


Fig. 2. Mean scores for the subscales of the *Perseverance Scale* for adolescents of different ages (vertical bars denote 95% confidence intervals)

gested that high-achieving students would demonstrate higher perseverance scores.

To test this hypothesis, a two-way ANOVA was performed, comparing two contrasting groups of students with differing academic performance: high-achieving students (those receiving predominantly A's, $N = 448$) and low-achieving students (those receiving predominantly C's, $N = 360$) across all subscales of the *Perseverance Scale*. The analysis revealed a statistically significant interaction between academic performance and the subscales of the *Perseverance Scale*, indicating distinct perseverance profiles for high- and low-achieving students ($F(2, 1612) = 69.77$; $p < 0.0001$; $h^2 = 0.08$). Specifically, high-achieving students exhibited higher levels of *Perseverance in Achieving Goals* and *Perseverance in Overcoming Difficulties*, whereas their levels of *Inappropriate Persistence* did not differ significantly from those of low-achieving students (Fig. 3).

Among low-achieving students, the scores across all subscales of the *Perseverance Scale* do not differ significantly, with values close to four points. This indicates that, on average, their responses tend to reflect neutrality (e.g., 'it depends'). In contrast, high-achieving students demonstrate greater variability in subscale scores: *Perseverance in Achieving Goals* scores are the highest, followed by *Perseverance in Overcoming Difficulties*, while *Inappropriate Persistence* scores are the lowest.

These findings suggest that high-achieving students are characterized by strong purposefulness, perseverance in achieving goals, a consistent desire to complete tasks, resilience in overcoming internal and external obstacles, hard work, and patience. The results align with the conclusions of the meta-analysis by [25], which found the most significant differences between groups with differing academic performance on the *Perseverance in Achieving Goals* subscale.

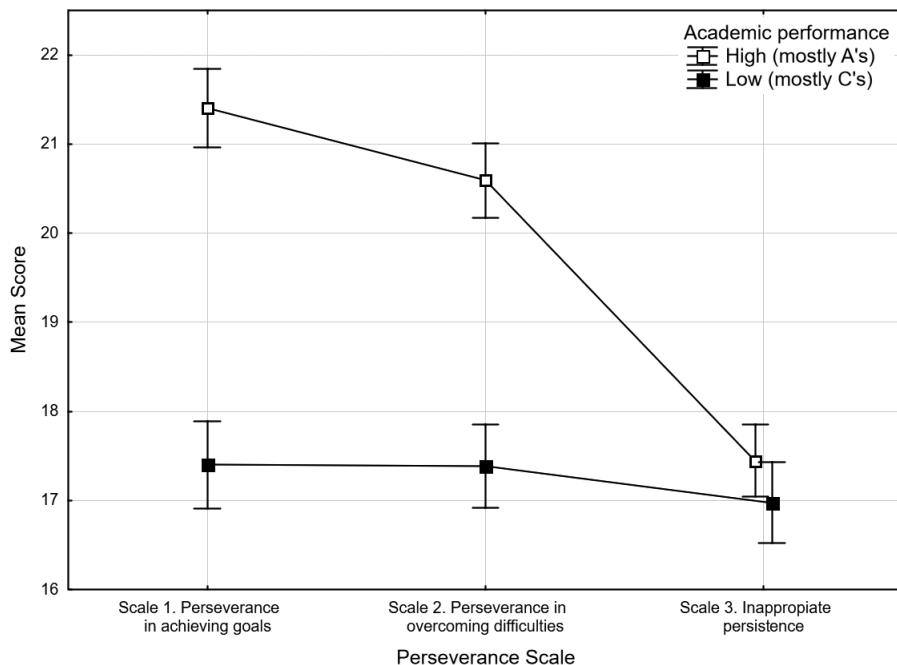


Fig. 3. Mean scores for the subscales of the *Perseverance Scale* for students with different academic achievement levels (vertical bars denote 95% confidence intervals)

Conclusions

The new *Perseverance Scale* comprises three components, allowing for the differentiation of *Perseverance in Achieving Goals*, *Perseverance in Overcoming Difficulties*, and *Inappropriate Persistence*. It is suitable for adolescents aged 12—18 years.

The expected correlations between the subscales of the *Perseverance Scale* and indicators of life satisfaction across different domains (family, school, teachers, self, friends), as well as various aspects of school engagement and indifference (behavioral, cognitive, emotional, and social), support the validity of the questionnaire. While adolescent girls and boys do not differ significantly in perseverance indicators, the components of perseverance evolve differently with age. For adolescents aged 12—13, the three subscales are highly differentiated: the highest scores are observed for *Perseverance in Achieving Goals*, fol-

lowed by *Perseverance in Overcoming Difficulties*, and the lowest scores for *Inappropriate Persistence*. As adolescents age (14—15 years and 16—18 years), the scores for *Perseverance in Achieving Goals* and *Perseverance in Overcoming Difficulties* become more balanced. Notably, *Perseverance in Overcoming Difficulties* increases significantly with age, reflecting the development of more mature forms of behavior in older adolescents.

High-achieving students exhibit higher scores of *Perseverance in achieving goals* and *Perseverance in overcoming difficulties*, alongside lower scores for *Inappropriate persistence*. In contrast, the perseverance profiles of low-achieving students appear “flattened,” with no significant differences between the three subscales. This finding highlights the need for targeted interventions for low-achieving students. It is recommended to focus on fostering their perseverance in

achieving meaningful goals and overcoming difficulties.

The limitations of this study include insufficient data on the external validity of the *Inappropriate Persistence* subscale and the inability to identify a distinct subscale for *Perseverance in Achieving Success*, which

remains an area for further development. These limitations also present opportunities for future research.

In conclusion, the new *Perseverance Scale* has potential applications in school psychological practice to provide psychological support, while accounting for the identified limitations.

APPENDIX 1

Perseverance Scale

Instructions: How do you usually behave in different situations?

For each statement below, indicate the extent to which you agree or disagree. When answering, think about your overall behavior, not about how you think you should be or want to be. There are no right or wrong answers, so please answer honestly.

Response Options

1 — Strongly Disagree

2 — Disagree

3 — Partially Disagree

4 — It depends

5 — Partially Agree

6 — Agree

7 — Strongly Agree

1. I can be called a goal-oriented person.
2. I patiently study something new until I understand the essence.
3. Sometimes I catch myself continuing to do something, even if it is pointless.
4. I always achieve my goals.
5. Despite difficulties, I persistently continue to act until I solve the problem.
6. I will keep trying to do something, even if I know that my actions are useless.
7. The phrase: 'Where there's a will, there's a way' is about me.
8. My motto is 'Little strokes fell great oaks' ('Patience and perseverance surmount every difficulty').

9. Nothing will make me change my mind.

10. I can maintain interest in a task that needs to be completed for a long time.

11. People fail much more often due to lack of persistence than due to lack of talent.

12. In an argument I defend my opinion to the end.

For all scales, the sums of points are calculated:

Scale 1. Perseverance in achieving goals = $Q1 + Q4 + Q7 + Q10$

Scale 2. Perseverance in overcoming difficulties = $Q2 + Q5 + Q8 + Q11$

Scale 3. Inappropriate persistence = $Q3 + Q6 + Q9 + Q12$

Comparison of the models for invariance tests for the Persistence Scale for gender and age invariance

Groups	Invariance	$\chi^2(df)$	CFI	RMSEA	RMSEA CL [-90%; +90%]	SRMR	$\Delta\chi^2 (\Delta df)$	ΔCFI	$\Delta RMSEA$	$\Delta SRMR$
Age	Configural	702.14** (153)	0.934	0.046	[0.042; 0.049]	0.0556	—	—	—	—
	Metric	717.82** (171)	0.934	0.043	[0.040; 0.046]	0.0553	15.67 (18)	<0.001	0.003	<0.001
	Scalar	760.17** (189)	0.931	0.042	[0.039; 0.045]	0.0554	42.36** (18)	0.003	-0.001	<0.001
Gender	Configural	666.60** (102)	0.933	0.057	[0.053; 0.061]	0.0503	—	—	—	—
	Metric	682.01** (111)	0.932	0.055	[0.051; 0.059]	0.0530	15.41 (9)	0.001	0.002	0.003
	Scalar	702.71** (120)	0.930	0.053	[0.049; 0.057]	0.0531	20.70* (9)	0.002	-0.002	<0.0001

Note: age groups N1 = 673 (12-13 years), N2 = 718 (14-15 years), N3 = 327 (16-18 years); gender groups N1 = 793 (male), N2 = 925 (female); χ^2 , chi-square test empirical value; *df*, degrees of freedom; *CFI*, comparative fit index; *RMSEA*, root mean square error of approximation; *RMSEA CL* [-90%; +90%], 90% confidence limit for *RMSEA*; *SRMR*, standardized root mean square residual; $\Delta \chi^2$, the difference in χ^2 between models; Δdf , the difference between *df* between models; ΔCFI , the difference in *CFI* between models; $\Delta RMSEA$, the difference in *RMSEA* between models; $\Delta SRMR$, the difference in *SRMR*, the difference in standardized root mean square residuals between models; * — $p < 0.05$; ** — $p < 0.01$.

APPENDIX 3

Norms for subscales of the Persistence Scale for adolescents of different ages: low level, scores below the lower quartile for the subscale; high level, scores above the upper quartile for the subscale

Level	Scale 1. Perseverance in achieving goals		Scale 2. Perseverance in overcoming difficulties		Scale 3. Inappropriate persistence	
	Low	High	Low	High	Low	High
Age	12—15 years					
	4—15 points	16—23 points	4—15 points	16—22 points	4—14 points	15—20 points
	16—23 points	24—28 points	16—22 points	23—28 points	15—20 points	21—28 points
Gender	16—18 years					
	4—16 points	17—24 points	4—16 points	17—23 points	4—14 points	15—20 points
	17—24 points	25—28 points	17—23 points	24—28 points	15—20 points	21—28 points

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Получена 23.02.2024

Принята в печать 30.12.2024

Received 23.02.2024

Accepted 30.12.2024