TEACHER EXPECTATIONS, SOCIAL-EMOTIONAL SKILLS AND ACADEMIC ACHIEVEMENT IN PRIMARY SCHOOL: THE ROLE OF MEDIATOR

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Abstract/Izvleček
This study investigates the mediating role of primary school students' socioemotional skills, such as goal-achievement skills, collaboration, and emotional management in the relationship between teachers' expectations and students' academic achievement. The study is based on data from the START-PROGRESS longitudinal study, which includes Russian schoolchildren and teachers. Structural equation modelling was used to model complex relationships between variables, including direct and indirect pathways of effect. The findings revealed that among the three socioemotional skills examined, only goal-achievement skills weakly mediated the relationship between teachers' expectations and students' academic achievement in the middle of primary school, and only in mathematics.

Učiteljeva pričakovanja, socialno-čustvene veščine in šolski uspeh osnovnošolcev: vloga mediatorja
V študiji smo raziskovali vlogo mediatorja (posrednika) pri povezavi med učiteljskimi pričakovanji in šolskim uspehom učencev v osnovni šoli. Pri tem smo kot posredniške dejavnike obravnavali socialno-čustvene sposobnosti učencev, to so sposobnosti *doseganja ciljev, sodelovanje* in *upravljanje čustev*. Študija temelji na podatkih longitudinalne raziskave START-PROGRESS, ki vključuje ruske osnovnošolce in učitelje. Za modeliranje zapletenih odnosov med spremenljivkami, vključno z neposrednimi in posrednimi učinki, je bila uporabljena strukturna enačba modeliranja (SEM). Ugotovitve so pokazale, da se je med tremi preučenimi socialno-čustvenimi sposobnostmi le pri sposobnosti *doseganja ciljev* pokazala šibka povezava med učiteljevimi pričakovanji in učnim uspehom učencev na sredini osnovne šole, in sicer le pri matematiki.

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Introduction

Teacher expectations are significantly associated with student outcomes through the phenomenon of self-fulfilling prophecies (Rosenthal and Jacobson, 1968). High teacher expectations are positively associated with academic success, often referred to as the Pygmalion effect (Wang, Rubie-Davies, and Meissel, 2018; Rosenthal and Jacobson, 1968), and tend to strengthen over time (Jamil, Larsen, and Hamre, 2018; Jamil, Stephan, and Bennett, 2024). Conversely, low teacher expectations can hinder academic achievement, particularly in elementary school settings (the Golem effect) (Gentrup, Lorenz, and Kogan, 2020; Babad, Inbar, and Rosenthal, 1982; Reynolds, 2007). While the direct impact of teacher expectations on student achievement is well-documented, the underlying mechanisms that explain *how* these expectations translate into academic results are less understood. This study argues that socio-emotional skills (SES) are a key mediating pathway in this process.

There is evidence indicating that the effect of teacher expectations is not purely direct but is mediated by various student psychological characteristics. In a comprehensive review of studies between 2008 and 2018, Johnston, Wildy, and Shand (2019) claim that students' reactions to teacher treatment are an important step in the expectation–effect process, yet they have seldom been "directly empirically linked with teacher expectations". Building on this, previous research, including another major review by Wang, Rubie-Davies, and Meissel (2018), has quantitatively established that psychological constructs such as students' self-concept (Friedrich et al., 2015; Szumski and Karwowski, 2019), attributional style (Zhou and Urhahne, 2013), feelings of academic futility and perceptions of teacher support (Agirdag, van Avermaet, and van Houtte, 2013; Demanet and van Houtte, 2012), as well as motivation and engagement (Zhu, Urhahne, and Rubie-Davies, 2018) can act as significant mediators. While this line of research is invaluable, attention has mainly focused on broad internal dispositions. Less attention has been paid to specific, learnable behavioural skills that translate those internal beliefs into effective academic action.

In this study, such skills are conceptualized as socio-emotional skills (SES), that is, patterns of thought, feeling, and behaviour that enable students to regulate their emotions, build relationships, and pursue goals valued in the school context (CASEL, 2008; OECD, 2015). SES are related to academic achievement, engagement, and long-term educational trajectories (OECD, 2015; Moeller, Theiler, and Wu, 2012). Based on OECD's taxonomy, we focus on three domains of SES

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that are particularly relevant in Russian elementary school: goal-achievement skills (e.g., persistence and planning in learning tasks), collaboration (e.g., working effectively with peers and teachers), and emotion management (e.g., regulating frustration and staying calm in challenging tasks) (Orel and Kulikova, 2020). These domains represent concrete, observable competences that can be shaped by classroom experiences and teaching practices.

Theoretically, SES are well positioned to function as a key mediating pathway connecting teacher expectations and academic outcomes. It is presumed that teachers who have high expectations offer challenging tasks, richer feedback, and explicit guidance on how to set and pursue academic goals; all these things allow students to develop their goal-attainment skills, collaborate, and manage their emotions (Rubie-Davies, 2008; Wang, Rubie-Davies, and Meissel, 2018). This guidance is particularly important in elementary school, where children's self-regulation is not fully developed, and in several educational systems, including the Russian national curriculum, such personal learning outcomes are explicitly required (Orel and Kulikova, 2020; https://fgos.ru/). In turn, students who can manage their emotions, collaborate productively, and persevere toward goals feel better equipped to cope with academic demands and produce better results (OECD, 2015; Moeller, Theiler and Wu, 2012; Urgo and Arguello, 2023). Simultaneously, students' socio-emotional behaviours may also shape how teachers perceive and evaluate them, which can result in reinforcing higher or lower expectations.

Despite this strong theoretical rationale, there is limited empirical research that jointly examines the mediating role of specific SES domains within the teacher expectations-achievement link, especially in elementary school. The present study addresses this gap by investigating whether three socio-emotional skills, goal-achievement skills, collaboration and emotion management, mediate the longitudinal association between teacher expectations and students' academic outcomes in mathematics and reading. By adopting a skills-based perspective on the mechanisms of teacher expectations, this study aims to contribute to a more nuanced understanding of how self-fulfilling prophecies unfold in the classroom.

Methodology

Sample

This study uses data from two linked longitudinal projects in a large Russian region: the START study (Grades 1-2) and the PROGRESS study (Grade 3).

The initial sample for the START project was established via a two-stage stratified cluster random design, encompassing 288 classrooms from 195 schools at the beginning of first grade (2019) and was maintained through the beginning of second grade (2020). The follow-up data collection for the PROGRESS study in the fall of 2021 was restricted to the regional capital because of challenges related to the COVID-19 pandemic. The final analytical sample was created by merging these datasets and filtering for participants with complete data from both the Grade 2 (START) and Grade 3 (PROGRESS) waves. This procedure yielded a sample of 1901 students nested within 90 classrooms.

The student sample was gender-balanced (49.9% girls) with a mean age of 9 years (SD = 0.41). These students were from public schools, and their performance data was collected using computer-based tests and questionnaires at the beginning of Grade 3 (fall, 2020). The 90 teachers were the students' main instructors, averaging 22 years of experience (SD = 11), with 84% holding a university degree in education. Teacher expectations for each student were collected using a standardized online questionnaire at the beginning of Grade 2 (fall, 2020).

All students had parents sign informed consent to participate in the study.

Assessment Tool

The START and PROGRESS tools, developed at the Institute of Education of the Higher School of Economics, were used in the START-PROGRESS longitudinal study based on the international performance indicators in primary schools (iPIPS) (Tymms, Merrell, and Wildy, 2015).

START is aimed at diagnosing a child upon entry to the school and assessing his academic progress during the first year of study; the tool has good psychometric properties and validity (Kardanova et al., 2018; Orel et al., 2018). The tool measures the basic starting skills in mathematics and reading. Additionally, the study can collect contextual information through questionnaires from teachers and parents.

PROGRESS (Federiakin, Larina, and Kardanova, 2021) is an extension of the START tool and assesses the basic literacy of elementary school students (reading, mathematical, and language), and some socioemotional skills. To be able to measure students' development, PROGRESS can have some tasks in common with START. Thus, START was conducted at the beginning of the first and the beginning of the second grade, and PROGRESS was conducted at the beginning of the third grade.

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Data from all measurements were used to construct a single scale using psychometric methods of vertical alignment of tests via a common–item design (Kolen and Brennan, 2013).

Socioemotional Skills

PROGRESS assesses the following socioemotional skills of students through questionnaires: goal achievement, collaboration, and emotion management (Orel and Kulikova, 2018; Kulikova and Orel, 2021).

Goal-achievement skills were assessed with items capturing students' persistence with and effort in schoolwork, for example: "I feel like I complete tasks thoroughly and to the end" and "I feel like I keep working on a task until I finish it". Emotion management was measured with items describing how students regulate their feelings in challenging situations, for example: "I feel like I stay calm in stressful situations" and "I feel like it is difficult to make me lose my temper". Collaboration (working with others) was assessed with items about students' typical behaviour in social and learning interactions, for example: "I feel like I am sociable and like being with other people" and "I feel like I am kind and considerate to almost everyone". The scales "Goal Achievement" consisted of 7 statements, "Collaboration" had 8 statements, and the scale "Emotion Management" consisted of 5 statements with response categories presented by the Likert scale: from 1 - "completely disagree" to 4 - "completely agree".

The raw scores for each of the scales were analysed using confirmatory factor analysis (Babyak and Green, 2010). The models for each scale showed significant unidimensionality and high data compliance with the model (see Table 1).

Table 1
Confirmatory factor analysis model fit statistics for scales

Scale	CFI[a]	TLI[b]	RMSE[c] (90%CI)	SRMR[d]
Goal achievement	0.988	0.981	0.044 (0.034-0.055)	0.036
Collaboration1	0.995	0.993	0.033 (0.024-0.043)	0.031
Emotional management1	0.991	0.977	0.040 (0.0220-0.061)	0.027

[1] When constructing the "Collaboration" and "Emotional management" scales, two items were highly correlated with each other. To improve the model quality, the presence of correlation was explicitly indicated in the model specification; [a] should be greater than 0.95; [b] should be greater than 0.95; [c] should not exceed 0.08, preferably not greater than 0.05; [d] should be lower than 0.08.

Conducting Tests and Surveys of Students

The START and PROGRESS studies were conducted in the format of computer testing in game form using an adaptive algorithm. The adaptive algorithm ensured that students were not presented with tasks that were too difficult for them. Testing within the framework of START and PROGRESS is individual, meaning that each student completes their test under their ID.

The students were surveyed using the same software that was used for PROGRESS testing. Students also had access to the survey using an ID. For each parameter, students were asked to read a series of statements and evaluate their attitude toward these statements or the degree of their agreement.

Teacher Expectations

Teacher expectations were measured at the beginning of the second grade. Teacher expectations were assessed for each student and were measured using a questionnaire that included four questions: two questions about the teacher's expectations for children's performance in mathematics and two questions about reading. The questionnaire asked the teacher to estimate the likelihood (from 0 to 100%) that he or she believed a particular child would demonstrate high academic achievement and be successful in elementary school in mathematics or reading. The questions were as follows:

Please estimate with what probability (from 0 to 100%), in your opinion, this child will do the following:

1. achieve only excellent or good grades in math in the 2nd and 3rd grades,
2. be able to solve advanced math problems,
3. achieve only excellent or good grades in reading in the 2nd and 3rd grades,
4. independently read books not included in the school curriculum (Yusupova, 2023).

Initially, two variables were planned: "teacher expectations for mathematics" and "teacher expectations for reading". However, given the strong correlation (Spearman's $r = 0.82$, $p < 0.001$), a single variable "teacher expectations regarding children's academic success" was created. Thus, teacher expectations were measured as the average score of responses to all questions.

Teacher Survey Procedure

The teacher survey was also conducted in computer form. Teachers filled out electronic questionnaires using individual links.

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Analytical Approach

The data were analysed using structural equation modelling (SEM). To provide the most effective estimation of the model based on all available observations, we used the maximum likelihood method, with robust estimation of standard errors (MLR) and the full information maximum likelihood estimation method (FIML) (Enders and Bandalos, 2001).

The following recommendations were used as criteria for assessing the fit of the model to the data (Mueller and Hancock, 2018): the value of the standardized root mean square residual (SRMR) should be less than 0.08; the value of the root mean square error of approximation (RMSEA) and the boundaries of its confidence interval should not exceed 0.08 (preferably not greater than 0.05); the value of the comparative goodness of fit index (CFI) and the Tucker-Lewis goodness of fit index (TLI) should be at least 0.95. Bootstrap analysis (5000 samples) was used to assess the statistical significance of the model parameters.

Variables used in the analysis

Dependent variables:

- academic indicators: reading and math scores at the beginning of grade 3 (logits).

Predictors:

- teacher expectations as measured at the beginning of grade 2 (on a 100-point scale).

Mediators:

- goal achievement (latent estimates obtained by Maximum Likelihood);
- collaboration (latent estimates obtained by Maximum Likelihood);
- emotion control (latent estimates obtained by Maximum Likelihood).

Covariates:

- academic indicators: reading and math scores at the beginning of grade 2 (logits).

In addition to regression relationships, the models also included correlations between the socioemotional skills scale and between academic indicators (for grade 2) in mathematics and reading.

RStudio version 2024.04.2+764 (R version 4.2.2 (https://www.r-project.org/)) was used for statistical analysis. Analysis was performed using the lavaan (https://lavaan.ugent.be/tutorial/), lavaanPlot (https://lavaanplot.alexlishinski.c–

om/) packages. The dplyr (https://dplyr.tidyverse.org/) package was used to load data into RStudio.

Results

Descriptive statistics and correlations are presented in Table 2.

Table 2

Means, standard deviations, and correlations with confidence intervals

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Mathematics (Grade 2)	1.58	1.37							
2. Reading (Grade 2)	3.91	1.75	.59**						
3. Mathematics (Grade 3)	2.96	1.31	.66**	.48**					
4. Reading (Grade 3)	4.99	1.38	.50**	.64**	.58**				
5. Teacher expectations (Grade 2)	60.91	23.53	.46**	.46**	.45**	.46**			
6. Goal achievement skills (Grade 3)	0.28	2.04	.11**	.15**	.15**	.15**	.15**		
7. Collaboration skills (Grade 3)	0.56	2.69	.06*	.07**	.08**	.10**	.13**	.41**	
8. Emotion management (Grade 3)	0.19	1.70	.05	0.05	.08**	.09**	.08**	.45**	.39**

Note. M and *SD* are used to represent mean and standard deviation, respectively. * *p* < .05; ** *p* < .01.

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Figure 1

The structural equation model of teacher expectations with academic performance

* p < .05; ** p < .01; *** p < .001
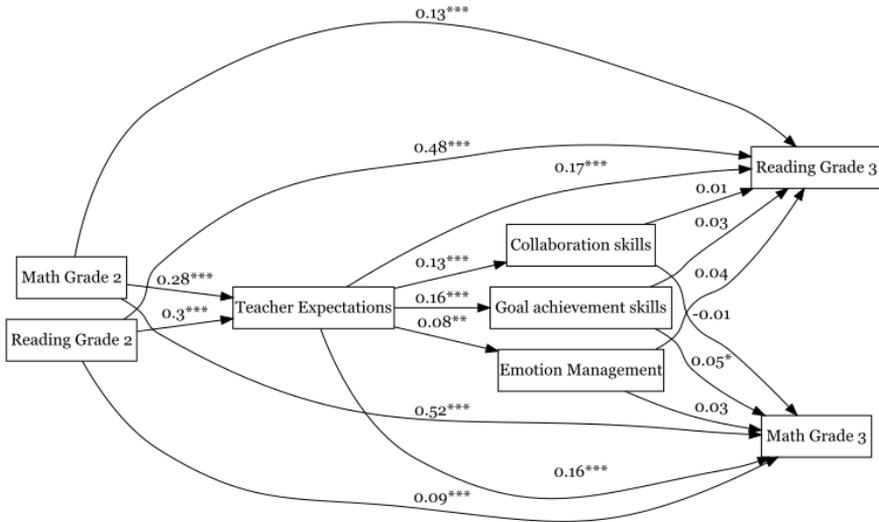
The resulting model (Figure 1) showed a good fit to the data: $\chi^2 = 11.423$; df = 6; p = 0.076; CFI = 0.999; TLI = 0.994; SRMR = 0.016; RMSEA = 0.022; 90% confidence interval for RMSEA: [0.000, 0.041]; N = 1901 (missing = 38). This means that the model is suitable for interpreting the parameters.

The results show that the direct relationship between teacher expectations and children's third-grade results in mathematics and reading is stronger than the indirect relationship through the mediators "goal achievement", "collaboration" and "emotion management" (for math (grade 2) β=0.16, p<0.001 and for reading (grade 2) β=0.17, p<0.001).

Teacher expectations are also positively related to socioemotional skills (for goal achievement skill β=0.16, p<0.001, for work with others skill β=0.13, p<0.001, and emotion control β=0.08, p<0.01).

Among the socioemotional skills, only the goal achievement skill is related to third-grade math scores (β=0.05, p<0.05), although the magnitude of the relationship is small. Thus, a statistically significant indirect relationship between teacher expectations and academic outcomes is found only for math.

Goal-achievement skills mediate this relationship. However, the indirect relationship is small, and the direct relationship remains stronger.

Discussion

This study examined whether elementary school students' socioemotional skills mediate the relationship between teachers' expectations and their academic performance using data from the START-PROGRESS longitudinal study on a sample of students from Russian schools. Students' academic performance was measured at the beginning of the second and beginning of the third grades, and their socioemotional skills at the beginning of the third grade. Teacher expectations were measured at the beginning of the second grade. The data was analysed using structural equation modelling, a method that allows the modelling of complex relationships between variables, including both direct and indirect pathways of effect.

The study showed that of the three socioemotional skills considered in the analysis, namely goal-achievement skills, collaboration, and emotion management, only goal-achievement skills mediate the relationship between teachers' expectations and students' academic performance in the middle of elementary school and only in mathematics. This finding complements previous research demonstrating that internal psychological constructs, such as academic self-concept, can mediate teacher expectation effects on mathematics achievement (e.g., Szumski and Karwowski, 2019), by adding a behavioural dimension to this model. In other words, our results suggest that teacher expectations may shape not only what students believe about their mathematical abilities, but also how persistently and strategically they act when engaging with mathematical tasks.

Although teacher expectations are positively related to the level of social-emotional skills analysed, collaboration skills and emotion management are not related to academic outcomes. Goal achievement skills weakly predict children's scores in mathematics and are not at all related to reading. Thus, the magnitude of the indirect relationship of teacher expectations with mathematics scores through goal achievement skills was very small, and the direct relationship of teacher expectations with academic performance is still strong.

The indirect relationship through goal achievement skills somewhat extends the results of some qualitative studies. For example, a study by Rubie-Davies (2008)

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demonstrates that teachers with high expectations say that they try to develop children's planning and goal-achievement skills. Thus, teacher expectations can improve children's results through goal-achievement skills. This study provides empirical evidence. However, such an indirect effect was found for mathematics, but not for reading.

The presence of an indirect connection only for mathematics can be explained by the specificity of the subject. Longitudinal studies have similarly shown that teacher expectation effects are often stronger and more persistent in mathematics than in reading during the early school years (Hinnant O'Brien, and Ghazarian, 2009), which is consistent with the idea that mathematics is particularly sensitive to students' self-regulatory and goal-directed behaviours. Teacher expectations may be more clearly understood in mathematics lessons. In this area, there are clear criteria for success or failure. Reading success is intricately linked to various cognitive processes, like decoding efficiency, vocabulary knowledge, prior knowledge, and intrinsic motivation (Liebfreund, 2015). Nevertheless, the indirect effect for mathematics is small, and the direct effect is much stronger.

The negligible indirect effect could be explained by a small correlation between goal-achievement skills and mathematics achievements. Children in elementary school, with an average age of 9 years in the study sample, may be just beginning to develop their goal-achievement skills. As a result, the connections between these skills might be weak in the short term; however, the long-term effects could be more significant. Research indicates that feedback from teachers is crucial for the effective development of these skills (Ponomariovienė and Jakavonytė-Staškuvienė, 2024). Unfortunately, the ability to provide effective feedback to children is a skill that is not adequately emphasized in Russia (Kholmanskaya, 2024).

The lack of association between collaboration skills or emotional management skills and academic achievement may be explained by the age-specifics of the cohort. It is possible that these skills, especially emotion management, may have a more significant effect in the long term, for example, during adolescence. During adolescence, students are more likely to encounter more complex social situations and demands on self-regulation, the academic workload increases, and previously developed collaboration and emotion management skills may be critical for successful group work and maintaining positive relationships (Pellegrino, 2024). This opens up space for further research that could examine these correlations in older age groups.

Practical Implications

This study found that goal-achievement skills help students perform better in mathematics. Previous research has shown that students of high expectation teachers report higher perceived teacher support and more positive academic beliefs (Rubie-Davies et al., 2020), suggesting that expectations are most beneficial when they are communicated through supportive instructional practices rather than pressure alone. Therefore, teachers can improve student performance not merely by believing in them or setting high standards, but also by supporting their self-regulation and goal-setting behaviours. In math classes, teachers should provide feedback that emphasizes persistence and strategic planning, rewarding effort over just accuracy. Making learning goals clear and breaking down complex tasks into smaller goals help students understand expectations. By fostering a culture that values effort and strategic thinking, teachers can help students meet high standards and improve their learning.

Taken together, these findings support contemporary views that teacher expectations operate through multiple, partly overlapping psychological and behavioural pathways, and they highlight goal-directed self-regulation as one such pathway in the context of elementary school mathematics.

Conclusion

This study aimed to uncover the mechanisms underlying the teacher expectation effect by examining the mediating role of students' socio-emotional skills. Our results highlight that among the skills examined; goal-achievement skills play a unique role in mediating the link between teacher expectations and academic achievement in mathematics among elementary school students. This finding extends the "Pygmalion effect" theory by identifying specific, learnable behavioural mediators that translate teacher beliefs into student outcomes.

The study has several limitations. First, the study design does not allow for any causal inferences, since socioemotional skills were not measured at the beginning of the second grade. Second, socioemotional skills were measured in a self-report format. This approach is sensitive to subjectivity, especially in young children (Duckworth and Yeager, 2015). An alternative would be to use combined assessment methods, including surveys of teachers or observation of students in the learning environment,

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or the use of scenario-based tasks. Finally, teachers in our sample were highly experienced (on average, more than 20 years of teaching). Prior research suggests that experienced teachers tend to form relatively accurate expectations that closely reflect students' prior performance and behaviour (Seidel, Schnitzler, and Kosel, 2021; Jussim and Harber, 2005), which leaves less room for strong self-fulfilling prophecy effects. This may partly explain why the indirect effects observed in our study were small, and it also means that the findings should be replicated with more diverse, including less experienced, teacher samples.

Despite these limitations, the study underscores the importance of intentionally developing students' self-regulation and goal-setting skills as a practical strategy for teachers to maximise the positive impact of their expectations on student learning. In future research, to obtain a more complete picture, studies are needed on other age samples of children or an age-balanced sample of teachers, and studies using different methodologies for assessing socioemotional skills.

Data Availability Statement

The article is based on data fully presented and discussed within the article itself; therefore, no additional data archiving is required.

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