

Thematic article

Information and Trust in Parent-Teacher Cooperation – Connections with Educational Inequality

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Recommended citation:

Neuenschwander, M. P. (2020). Information and Trust in Parent-Teacher Cooperation – Connections with Educational Inequality. *Central European Journal of Educational Research*, 2(3), 19–28. <https://doi.org/10.37441/CEJER/2020/2/3/8526>

Abstract

There is an ongoing debate on how parents and the cooperation between parents and teachers contribute to educational inequality. In this study, the assumption that information and trust in parent–teacher cooperation mediate the effects of parent socioeconomic status (SES) on student achievement in mathematics and instruction language (German) was examined. The effects of information and trust on achievement were assumed to be mediated by parent self-efficacy expectation in German. The hypotheses were tested using a sample with 1001 students from 4th to 6th grade and their parents in Swiss primary schools using questionnaires and achievement tests at the beginning and the end of a school year. Results from structural equation models with longitudinal data showed that parent trust and parent self-efficacy expectation fully mediated the effect of SES and student achievement in language instruction but not in mathematics. Information did not correlate with SES nor with student achievement, but with trust. Parental trust in the cooperation with teachers affected achievement in both mathematics and German. The model combines the research on parental involvement with the research on educational inequality in school. Teachers need to establish trust in cooperation with low-SES parents to reduce educational inequality in school.

Keywords: parental involvement; student achievement; parent self-efficacy expectation; educational inequality; parent trust

Introduction

Effects of parental involvement on student achievement have been discussed for a long time (Fan, & Chen, 2001; Henderson & Berla, 2004; Epstein, 2018). Research shows that parent beliefs such as achievement expectations and self-efficacy expectation affect student achievement (Neuenschwander, Vida, Garrett, & Eccles, 2007; Yamamoto & Holloway, 2010). While parent characteristics strongly correlate with student outcomes, the effects of parent–teacher cooperation on student outcomes are inconsistent. The frequency of contacts between parents and teachers sometimes even correlates negatively with student achievement (Neuenschwander et al., 2005). Moreover, teachers are expected to reduce educational inequality through the cooperation with parents by informing and supporting parents with low socioeconomic status (SES). Through cooperation, teachers can align the level of information and support between parents with low SES and high SES and thus reduce disadvantages of children with low SES. Little is known about how parental involvement is connected to educational inequality (Epstein, 2018). More knowledge about this topic would give teachers guidelines on how to cooperate with parents to increase educational equality. Can educational inequality be reduced by cooperation between parents and teachers? More precisely: Do aspects of parent–teacher cooperation, such as information and trust, explain the effects of SES on student achievement in mathematics and German in Swiss primary schools?

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Parent–Teacher Cooperation and Student Achievement

Parent–teacher cooperation is conceptualized as communication between parents and teachers for the coordination of child-related activities (Neuenschwander et al., 2005). From a legal perspective, parents delegate a part of their responsibilities over their child to schools, because they do not have the required professional competence to teach complex topics. Therefore, teachers and parents have to share relevant information about the child, and they have to establish trust that all involved partners are interested in the child's welfare. Thus, establishing information and trust are important characteristics of parent–teacher cooperation.

(1) According to Swiss federal law, teachers must inform parents regularly about school events and about their child's learning and behavior in school (Neuenschwander, 2020). In contrast, parents are not obliged to inform teachers about their child, but they often voluntarily inform teachers about student characteristics that affect classroom processes. Parents need information about school to support their children's learning so they can meet the goals of the curriculum. Parents are especially interested in being informed about students' evaluation and grading, and about the classroom processes (Neuenschwander et al., 2005). Therefore, and in line with previous findings, a high level of parent information about the classroom increases student achievement (Neuenschwander et al., 2005).

Teacher information about the classroom influences parental self-efficacy expectation to support their child's learning because this information includes advice on how parents can effectively support their child (Park & Holloway, 2013). Parents self-efficacy expectation is a domain-specific parent belief in their ability to master a specific task such as supporting their child's learning in a school subject (Bandura, 1977; Zimmerman, 1995). Parents self-efficacy expectation predicts student achievement (Eccles & Harold, 1993). High self-efficacy expectation in a subject indicates that parents believe that they can effectively instruct and motivate their child's learning and thus affect student achievement in this subject (Neuenschwander, 2020). However, prior research showed effects of parent self-efficacy expectation on student achievement in German but not in mathematics (Niederbacher & Neuenschwander, 2020). According to Eccles and Harold (1993) parent self-efficacy expectation is reduced as the difficulties of the academic tasks increase. Parent self-efficacy expectation may lose its effect on student achievement in mathematics because of the higher complexity of the tasks. Therefore, parents' self-efficacy expectation mediates the effect of information in parent–teacher cooperation on student achievement in German, but not in mathematics.

(2) Teachers do not only have to inform parents; they also have to establish a relationship of mutual trust with the parents. Adams and Christenson (2000) define trust in the parent-teacher relationship as "confidence that another person will act in a way to benefit or sustain the relationship, or the implicit or explicit goals of the relationship, to achieve positive outcomes for students" (p. 480). Adams and Forsyth (2006) worked out a multidimensional concept of trust in parent–teacher cooperation. There is little research on trust in parent–teacher cooperation, although it is an important aspect of the parent–teacher relationship. Parents report higher levels of trust in parent–teacher cooperation than do teachers (Adams & Christenson, 1998). The trust level in elementary school is higher than in middle school and high school (Adams & Christenson, 2000). Mutual information is a prerequisite to establishing trust in parent–teacher cooperation. Trust in parent–teacher cooperation is improved by communication and by a teacher's dedication to a positive academic environment in school (Adams & Christenson, 2000). To increase trust, teachers have to explain to the parents that they professionally teach and support their child.

High parent self-efficacy expectation includes being confident and knowing how to support the child's learning. Parents who trust in the teacher develop a higher self-efficacy expectation to support their child's learning in various school subjects. In trustworthy cooperation, teachers as professionals increase parents' self-efficacy expectation to support their child's learning and create a positive attitude toward school (Adams et al., 2009), by showing that schooling and learning are important and by giving advice on how to support their child's learning. Teachers who establish trust in their cooperation encourage parents to support their child's learning. As introduced, parental self-efficacy expectation predicts student achievement in German. Therefore, and in line with prior research, it is assumed that parents' trust affects student achievement (Adams & Christenson, 2000; Santiago, Garbacz, Beattie, & Moore, 2016). This effect is mediated by parent self-efficacy expectation in German, but not in mathematics.

Educational Inequality

From the perspective of educational equality, student achievement should only depend on students' cognitive potential such as intelligence and on student motivation (Giesinger, 2007). However, many studies

showed correlations between family SES and student achievement (Sirin, 2005), which indicates that student achievement also depends on social factors such as family support. The level of this correlation varies between countries (Konsortium PISA.ch, 2018), indicating that the national characteristics of educational systems play a role. In this paper, this correlation is interpreted as an indicator for educational inequality. While there is much research on how parental expectations (Davis-Kean, 2005) and parental competences (Ehmke & Siegle, 2008) explain the effect of SES on student achievement, there is little knowledge about the extent to which information and trust in parent–teacher cooperation is related to this effect. Henderson and Berla (2004) assumed that parent–teacher cooperation might offer an approach for reducing educational inequality through special attention given to low-SES parents. However, to involve low-SES parents in the school, is not sufficient to attain this goal (Alexander & Entwisle, 1996). Epstein (1991) reported programs to reduce home-school barriers that reduce the effect of SES on student achievement. Bakker et al. (2007) showed variability in forms of parent-teacher cooperation depending on parent SES. As a consequence of these findings it is assumed that information and trust in parent–teacher cooperation are predicted by family SES (Park & Holloway, 2013; Adams et al., 2009). High-SES parents received longer and more advanced training in the education system than did low-SES parents, which helps them better understand school processes. High-SES parents are interested in schooling and collect information about schooling from many sources such as parents of other children, websites, and technical reports about schooling and others. Typically, they are able to understand the organization and curriculum of the school. Thus, high-SES parents are more informed about schooling processes than low-SES parents. Moreover, high-SES parents have more trust in state institutions such as schools than do low-SES parents (Lareau & McNamara Horvat, 1999). They have more knowledge about the classroom and a better understanding of schooling than do low-SES parents. Additionally, teachers vary in their communication with the parents by SES (Alexander & Entwisle, 1996). Therefore, high-SES parents have more trust in the cooperation with teachers. In summary, parents with high SES report being better informed about school and establish more trust in their cooperation with teachers than do parents with low SES. As introduced above, it is assumed that information and trust in parent–teacher cooperation affects parent self-efficacy expectation to support child learning and student achievement in mathematics and German. Thus, information and trust mediate the effect of SES on student achievement in mathematics and German.

To summarize, the following hypotheses were tested:

- 1) High SES corresponds with high achievement in German (H1a). This effect is positively mediated by the level of information (H1b) and trust (H1c) in parent–teacher cooperation.
- 2) High SES corresponds with high achievement in mathematics (H2a). This effect is positively mediated by the level of information (H2b) and trust (H2c) in parent–teacher cooperation.
- 3) High levels of information (H3a) and trust (H3b) in parent–teacher cooperation correspond with high achievement in German. These effects are mediated by parents' self-efficacy expectation in German (H3c).
- 4) High levels of information (H4a) and trust (H4b) in parent–teacher cooperation correspond with high achievement in mathematics.

Research design and Methods

Participants

To examine the hypotheses, a sample of primary school students and their parents was used. Randomly selected primary schools from six German-speaking Swiss cantons were asked to participate in the study. School principals, teachers, and parents were asked for their consent to participate in the study. In total, 1,152 students participated in the study. Students were enrolled in grades 4 to 6 (mean age 10.7 years, 51.8% girls). Students whose German skills were judged by the teachers as too low to be able to participate in the assessment were excluded from the study. The sample included 1,098 parents of these students. The first parental person of reference (mean age = 42.1 years) was the mother (73.3%), the father (19.4%), or another adult (7.3%). The second parental person of reference was the mother (19.4%), the father (63.3%), or another adult (17.3%).

Students took achievement tests at the beginning (pretest, t1) and the end (posttest, t2) of the 2016–2017 school year. Parents questionnaires were applied in pretest (response rate: 95%).

Instruments

Parent Questionnaire

Parent SES was assessed in the parent questionnaire with a question about the current occupations of the first and second parental person of reference. Professions were coded based on the International Standard Classification of Occupations (ISCO-08). Then, each occupation was coded with an International Socio-Economic Index of Occupational Status value (ISEI; Ganzeboom & Treiman, 2010). In the analyses, the highest value of the parents' occupations for each family was used (HISEI).

To assess self-efficacy expectations to support their child, parents answered two questions (Hoover-Dempsey & Sandler, 2005): "How well can you support the learning of your child in the following subjects? German; Mathematics." The rating scale for both subjects ranged from 1 (not well at all) to 6 (very well).

Cooperation with teachers was measured based on two constructs. Information from teachers was measured by three self-developed items such as "I am informed about the achievement of my child by the teacher" ($\alpha = .77$). Trust in cooperation with teachers was measured with three items such as "My collaboration with the teacher is based on mutual trust" ($\alpha = .68$). The items were answered on a rating scale from 1 (not true at all) to 6 (completely true).

Achievement Tests

Students' achievement in math and German was measured with an achievement test for each class level (fourth, fifth, and sixth grades). Students took the same test for the pretest and posttest. The curriculum-valid test items were open and closed. The math achievement test for the fourth and fifth grades included tasks about basic operations, applied calculations, logical thinking, and problem-solving. The test for the sixth grade also included tasks about fractions and decimal numbers. The German achievement tests for all class levels focused on vocabulary, grammar, text comprehension, and reading. The validity of the fifth and sixth grade tests in German and math has been reported in previous studies (Neuenschwander et al. 2013; Neuenschwander et al. 2014). The fourth-grade tests were developed specifically for this study and comprised tasks from Moser et al. (2011) as well as tasks from a standardized test (Roick et al. 2004). Split-half reliability values were good: Mathematics t1: rSH = 0.89–0.90, Mathematics t2: rSH = 0.90–0.94, German t1: rSH = 0.86–0.90, German t2: rSH = 0.84–0.95.

Items on the achievement tests were scored dichotomously, with 0 (incorrect) and 1 (correct). Subsets of items from the fourth- and fifth-grade tests were presented in the fifth- and sixth-grade tests (anchor item design). Based on the item response theory (Yen & Fitzpatrick, 2006), the linking method developed by Haberman (2009) was used to compute test values that were on the same metric for the fourth to sixth grades at both times of measurement. Weighted likelihood estimates were calculated (Warm, 1989).

Analytical procedure

The data is structured hierarchically, as students and parents are part of a classroom and referred to the same teacher. Thus, the multilevel structure was controlled for the standard errors by including "type = complex" in the Mplus syntax (Muthén & Muthén, 1998–2018).

Students with missing values in all variables and with missings on x-variables used in these analyses were omitted. As it can be assumed that data were missing at random (e.g., nine teachers and their classes left the study, students absent during the first or second survey due to illness or moving to another class), the missing data were treated with the full information maximum likelihood approach in the regression analyses (Little & Rubin, 2020). All available data were analyzed. A sample of 1001 students and parents was analyzed.

The evaluation of model adequacy was based on χ^2 statistics, comparative fit index (CFI), and root mean square error of approximation (RMSEA). A nonsignificant χ^2 value ($p > .05$) indicates a good fit between the model and the data. However, χ^2 values tend to become significant in large samples. Schermelleh-Engel et al. (2003) stated that good fit is indicated if the CFI is greater than or equal to .97 (acceptable fit: .95), the RMSEA is less than or equal to .05 (acceptable fit: .08). Results from structural equation model (SEM) analyses for a one-sided significance level are reported.

Results

Table 1 presents descriptive statistics and Pearson correlations of all included variables. Results show SES and trust correlate significantly with achievement in German and mathematics (t1 and t2). Parent self-efficacy expectation in German and Mathematics correlate with achievement in German and mathematics.

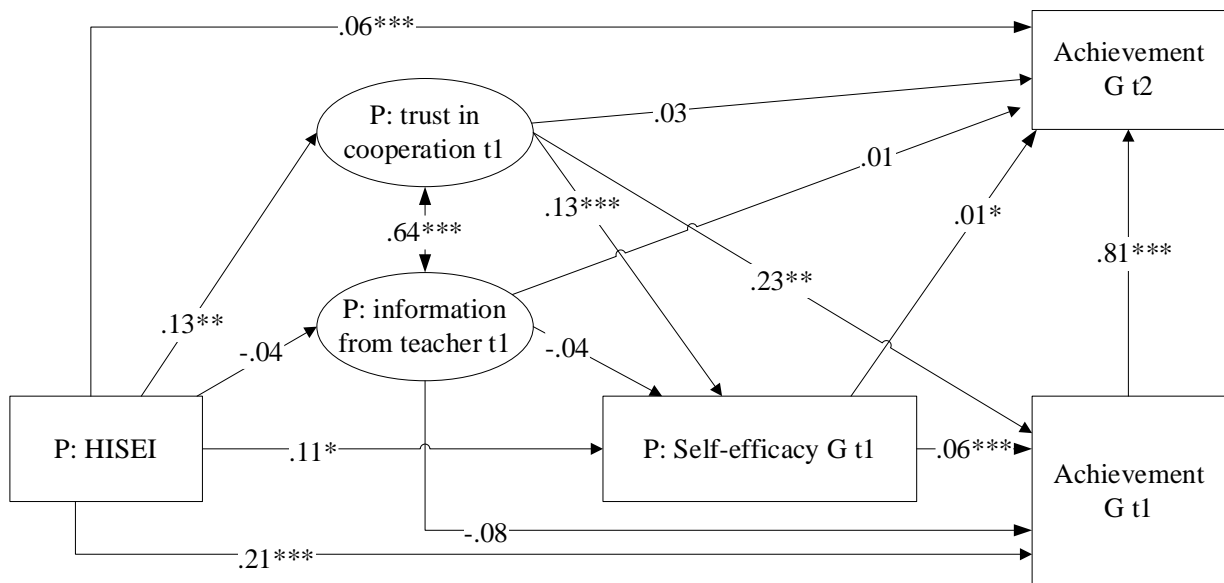
Table 1. Descriptive Statistics and Correlations

	N	M	SD	2	3	4	5	6	7	8	9
1. P: HISEI	1001	58.2	20.4	-.04	.11***	.21***	.33***	.19***	.21***	.24***	.27***
2. P: Information from teacher	1064	4.51	1.25	1	.41***	.01	-.02	.06*	.07*	.01	.01
3. P: Trust in cooperation	1047	5.00	0.98		1	.13***	.15***	.12***	.15***	.17***	.15***
4. P: Self-efficacy M	1064	4.92	1.10			1	.62***	.06*	.13***	.11***	.13***
5 P: Self-efficacy G	1067	4.87	1.16				1	.11***	.15***	.22***	.24***
6 Achievement M t1	1116	1.23	1.55					1	.83***	.62***	.60***
7 Achievement M t2	941	1.87	1.60						1	.65***	.66***
8 Achievement G t1	1113	0.41	1.01							1	.83***
9 Achievement G t2	940	0.79	1.05								1

Note. M: mathematics, G: German, P: parent data, t1: first measurement point, t2: second measurement point. HISEI: highest SES per family. *** $p < .001$, ** $p < .01$, * $p < .05$ (two-tailed).

To test the hypotheses, SEM for the subjects German and mathematics were estimated separately. The models include direct effects from SES on trust and information, on self-efficacy, and on achievement (t1 and t2). Direct effects from trust and information on self-efficacy expectation and achievement (t1 and t2), as well as direct effects from self-efficacy on achievement (t1 and t2) were estimated. Achievement t1 was included to control for prior achievement.

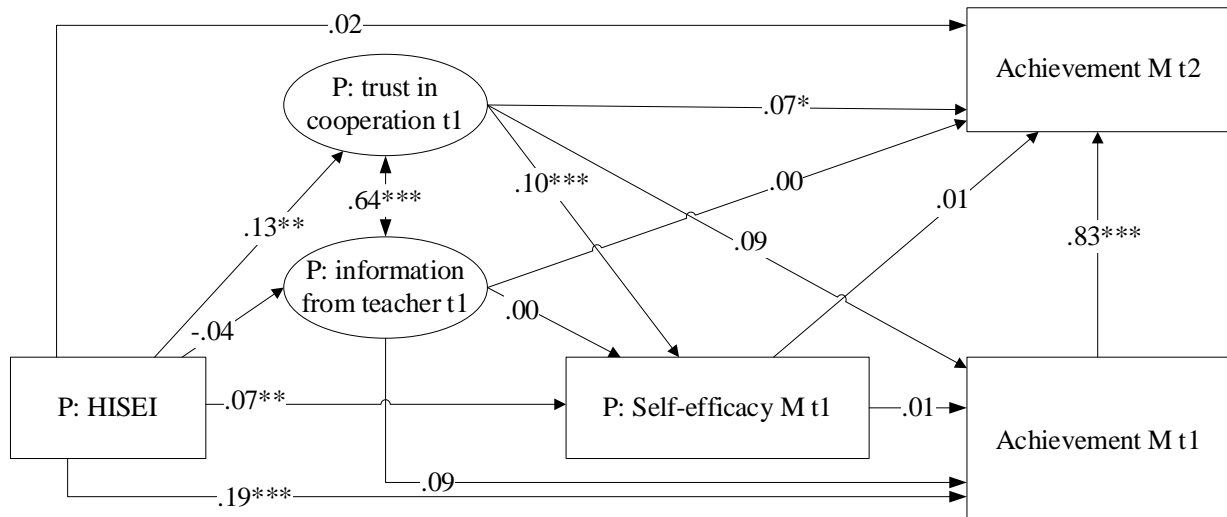
The three items used to measure information were predicted by a latent variable. The error terms between two of these items were correlated because of high degree of similarity between the items. The three items for trust were also predicted by one latent variable. The error terms between two of these items were correlated because of a high degree of similarity between the items. The model for German received acceptable fit indices ($\chi^2 = 71.1$, $df = 22$, $p < .001$, CFI = .96, RMSEA = .05; figure 1). Afterwards, all nonsignificant paths were fixed to 0 and the model was calculated again. The model fit indices slightly improved ($\chi^2 = 68.8$, $df = 26$, $p < .001$, CFI = .97, RMSEA = .04). For calculating total and indirect effects, we use the model that also includes the nonsignificant paths.

Figure 1 Structural Equation Model for German

Notes. P = parent data. G = German. t1 = first measurement time. t2 = second measurement time. *** $p < .001$, ** $p < .01$, * $p < .05$ (one-tailed).

As predicted in hypothesis H1a, a total effect from SES on achievement in German t2 was found. There was also a significant total indirect effect from SES on achievement in German t2. The indirect effect of SES on trust and on achievement t2 was significant (.001, $p < .05$). The indirect effect of SES on information on achievement t2 was not significant (.00, $p > .05$). Contrary to hypothesis H1b, information did not mediate the effect of SES on achievement t2, while trust did (H1c supported). Contrary to hypothesis H3a, information did not predict achievement t2 in German, but trust did (H3b supported). The effect of trust on achievement t2 was fully mediated by parent self-efficacy expectation in German (significant indirect effect .003, $p < .05$; H3c supported for trust, H3c rejected for information).

The model tested for mathematics included direct effects from SES on trust and information, on self-efficacy expectation, and on achievement (t1 and t2). Direct effects from trust and information on self-efficacy expectation and achievement (t1 and t2) as well as direct effects from self-efficacy on achievement (t1 and t2) were estimated. The measurement models for trust and information were defined the same way as in the models for German. The model received acceptable fit indices ($\chi^2 = 59.2$, $df = 22$, $p < .001$, CFI = .97, RMSEA = .04; figure 2). Afterwards, all nonsignificant paths were fixed to 0 and the model was calculated again. The model fit indices deteriorated slightly ($\chi^2 = 82.1$, $df = 29$, $p < .001$, CFI = .96, RMSEA = .04). For calculating total and indirect effects, we use the model that also includes the nonsignificant paths.

Figure 2. Structural Equation Model for Mathematics

Note. P = parent data. M = mathematics. t1 = first measurement time. t2 = second measurement time. *** $p < .001$, ** $p < .01$, * $p < .05$ (one-tailed).

As predicted in hypothesis H2a, the total effect from SES on achievement t2 was significant. The indirect effect of SES on achievement t2 mediated by information was not significant ($.00, p > .05$; H2b rejected). The indirect effect of SES on achievement t2 mediated by trust was not significant ($.00, p > .05$; H2c rejected). The total effect of information on achievement t2 was significant (H4a rejected), while the total effect of trust on achievement t2 was significant (H4b supported). The indirect effect of trust on achievement t2 mediated by self-efficacy was not significant ($.05, p > .05$). The indirect effect of information on achievement t2 mediated by self-efficacy was not significant ($.00, p > .05$).

Discussion

To establish an effective parent-teacher cooperation, teachers have to provide information to parents and need to establish trust. The results of longitudinal SEM with multiple mediation show that parents' trust in the cooperation with teachers highly correlates with teacher information and predicts student achievement in mathematics (in line with Adams & Christenson, 2000). However, teacher information does not predict student achievement. The effect of parent trust on achievement in German is fully mediated by parent self-efficacy expectation to support the child, while parents' trust directly affects student achievement in mathematics. An important new finding is that parental trust in teachers explains the connection between parent SES and student achievement in German but not in mathematics. These analyses contribute to the knowledge how parent-teacher cooperation influences educational inequality in school.

Prior research has shown that the level to which parents are informed about school correlated with student achievement (Neuenschwander et al., 2005). In contrast, the reported findings show that the level of information that parents receive from teachers does not correlate with student achievement. By law, teachers have to inform parents regularly about the students' situation in the classroom. This standardized information is the same for all children and therefore does not explain differences in student achievement. In addition, it does not depend on parents' SES. In contrast, knowing the extent to which parents are informed about school is important in explaining student achievement (Neuenschwander et al., 2005). Parents gather information about school not only from the teachers but also from other sources. The variance in parent information about the classroom, which is not communicated by teachers, is important in explaining student achievement. An open question remains whether teachers could give this important additional information to low-SES parents to reduce effects of SES on achievement.

Teachers vary in their ability to establish trust in the cooperation with parents (Adams & Christenson, 2000). Findings in this study, in line with previous research, show, that high-SES parents report more trust in teachers than low-SES-parents (Adams et al., 2009). Thus, teachers need a higher investment to establish trust with low-SES parents, because low-SES parents have generally lower trust in institutions such as politics, administrations, and schools (Lareau & McNamara Horvat, 1999). If teachers manage to foster a relationship of mutual trust with low-SES parents, they reduce the effects from SES on student achievement.

Parents in trusting relationships with teachers send verbal and nonverbal signals to children that learning and schooling are important (Adams & Christenson, 2000). These attainment values are internalized by the child (Eccles & Wigfield, 2002) and motivate the child to learn, which results in higher achievement (Adams & Christenson, 2000; Santiago et al., 2016). Moreover, parents and teachers who experience a trusting relationship better coordinate student-related activities and feedback. Consistent congruent expectations and communication at home and in school have been found to increase student motivation (Phelan et al., 1996). These concepts may explain the direct effect of parental trust on student achievement in mathematics.

The findings show that parent beliefs, such as information, trust in parent–teacher cooperation, and self-efficacy expectations to support their child, have subject-specific effects on student achievement. In line with previous research, parent self-efficacy expectations influence achievement in German but not in mathematics (Neuenschwander et al., 2005; Niederbacher & Neuenschwander, 2020). Prior research showed stronger effects of parental beliefs on achievement in school language than in mathematics (Epstein, 1991; Neuenschwander et al., 2005).

The study has several limitations. The parent–teacher collaboration was only measured from the parents' perspective. It was not possible to measure the teachers' strategies in their collaboration with parents and to include the teachers' perspective to evaluate the relationship with each parent. Teachers had limited time resources to fill out questionnaires. Further, parent self-efficacy to support their child was measured by a single item for each subject. Prior analyses showed that the item is valid and the test–retest reliability is high. Therefore, this single item approach was acceptable in this study. Additionally, the sample referred to grades 4–6 in Swiss primary school. Future research is needed to examine whether the results are the same for older and younger age groups and for other national education systems. Moreover, only achievement tests were used as dependent variables. It is worth studying the effects of trust and information in parent–teacher cooperation on motivational child outcomes and on school career decisions.

Conclusions (implications)

The results have several practical implications. When teachers cooperate with parents, education inequality does not necessarily decrease. On the contrary, findings show that parents trust in teachers mediates the effect of SES on student achievement in German. Thus, teachers have to actively establish trust in relations with low-SES parents to increase educational equality. In general, low-SES parents have less trust in public institutions such as schools (Lareau & McNamara Horvat, 1999). Thus, teachers need to provide support and information about classroom characteristics to low-SES parents in order to gain their trust in school. A challenge for teachers in establishing trust with low-SES parents is using language which the parents can understand and making the parents feel welcome in the school (Epstein, 2001). Low-SES parents need to experience that they can understand teachers' information and that the teacher accepts them, even though their educational level is low.

Future research should examine in more detail how parent–teacher cooperation explains educational inequality. Of special interest is whether trust in the parent–teacher cooperation also mediates the effect of immigration status on student achievement. Future research should also investigate other characteristics of parent–teacher cooperation that explain education inequality in school. The results of such studies might lead to a better understanding of the interaction between parent–teacher cooperation and educational inequality and could show strategies to increase educational equality.

Funding: This research was funded by Swiss Mercator Foundation (grant number 2014-0527), State Secretariat for Migration and the Swiss cantons Zürich and Aargau.

Acknowledgments: I thank Edith Niederbacher, Tamara Stotz, Janine Bölsterli, and Claudia Sacchetti for their help in conducting this study.

Author Contributions: The author takes responsibility for the integrity of the data and the accuracy of the data analysis.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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