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Parents' (dis)satisfaction with schools: Evidence from longitudinal administrative data from Spain

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Abstract

This study uses longitudinal census data to explore the correlates of school satisfaction among parents of 3rd and 6th grade students from Canary Islands, a large administrative region in Spain. We use logistic regression to model parental dissatisfaction with their children's school and teachers. Our results illustrate how parents value academic performance in reading and mathematics equally, while also placing equal emphasis on the development of cognitive and non-cognitive skills. Yet, we find that what matters the most to parents is their children's happiness at school, rather than their educational progress. We also find that teachers may be able to improve parental satisfaction by providing regular feedback to parents about their children's progress. Lastly, we discuss some implications for schools to meet parental needs; for example, schools should promote activities such as specialised workshops for parents on various topics ranging from child development to emotional development, stress management, and self-confidence.

Keywords: satisfaction and happiness; educational progress; non-cognitive outcomes

JEL Codes: I20, I21, I28.

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1. Introduction

Parents play a key role in developing their children's academic and socio-emotional skills. They choose their children's school and receive information about their progress from the school and their teachers (e.g., their academic performance, misconduct). Friedman, Bobrowski, and Geraci (2006) note that parental satisfaction with their children's school is an important factor to measure school effectiveness, and to identify opportunities for improvement. In fact, these authors indicate that parents' satisfaction with the quality provided by the school is an effective predictor of their school choice decision. However, parental satisfaction is not straightforward to measure, with previous studies suggesting it is multidimensional, including both academic (e.g., curriculum) and non-academic factors (e.g., school safety).

Several studies have found parental satisfaction to be related to their children's test scores. For instance, Gibbons and Silva (2011) analysed secondary education students in England, and found that test-score-based measures of school quality were related to parental satisfaction. However, another strand of literature has found other school characteristics to be important as well. One example is Griffith (1997), who found that parental satisfaction is related to parental perceptions of safety and school climate in the United States. Informing parents of their child's educational progress and empowering them were also important. Rätty (2010) analysed first-grade students in Finland, and found that parental satisfaction was linked to parents' own experiences in primary school. Kaczan, Rycielski, and Wasilewska (2014) analysed the same issue for pre-school students, and concluded that the strongest predictors of parental satisfaction are children's satisfaction with school and children's interest in their classes. Jónsdóttir, Björnsdóttir, and Bæck (2017) found that the majority of Icelandic parents were satisfied with their children's school, though parents who felt that the special needs of their children were not acknowledged reported lower satisfaction.

Regarding these determining factors, Friedman, Bobrowski, and Geraci (2006), who analysed 127 schools in the United States, stated that parental ethnic groups shared attributes with respect to school satisfaction, but the importance that each group gave to school characteristics, such as parental involvement, school administration, and technology, was different. However, for all ethnic groups, parental school satisfaction was influenced to a greater extent by their rating of school safety, followed by the school budget and teacher effectiveness. In addition, Tikkanen (2019) studied parental satisfaction with the school for primary education students in Finland, and found that schools with higher socio-economic status were positively related to higher parental satisfaction. Similarly, a meta-analysis by Rhinesmith (2017) underlined that private schools have higher levels of parental satisfaction than public schools. Therefore, the socio-economic and cultural characteristics of the families are also relevant to delimit parental satisfaction factors.

Others have argued that teachers are an important determining factor for parental satisfaction with schools. Thompson (2003) concluded that parental satisfaction with teachers was the most important factor in explaining this phenomenon in primary schools in the United States. Likewise, Skallerud (2011) found that teacher quality and parent engagement were linked to parental school satisfaction in Norway. Friedman, Bobrowski, and Markow (2007) identified five sources of parental satisfaction in the United States: receiving information from the school about their children, the degree of involvement they were afforded by teachers and the school, the adequacy of school resources, the effectiveness of the school leadership, and the correct management of the school budget. In this regard, Bronfenbrenner's ecological system theory (1979) highlights that young

people's development is affected by their personal experiences at different levels (microsystem and macrosystem), and the relationship between them (mesosystem). Essentially, not only do family and school contexts have consequences in their growth, the relation between the contexts and the quality of interaction between schools, parents, and teachers also have implications in this process. In this sense, certain factors influence the relationship between parenting and education. Specifically, in the context of a managerial model of educational provision, parents can be conceptualised as consumers of education, and, therefore, play different roles in relation to the school. For example, Vincent (1996) lists four types of roles that parents can have regarding their involvement in their child's education, which depends on their joint level of engagement as supporters or earners in the household. These roles are identified as supporters and earners, independent parents, parents as participants, and parents as consumers. In this respect, the teachers' approaches and concerns, school governance, and quality of education depend on the distribution of parental types among the pupils.

In addition, providing parents with more choices with regard to schools is beneficial for parental satisfaction. DeAngelis (2018) analysed a change in charter schools' assignment process in Arkansas, finding that the level of parental satisfaction was higher in an open-enrolment than in a district-conversion system. Rhinesmith (2017) reviewed 19 research studies that examined parental satisfaction with private school choice programs in the United States, finding that parents who can choose schools are more satisfied in the school surveys. According to Burgess *et al.* (2015), parents are seeking to maximise their utility when choosing their child's school, a process conditioned by the characteristics of the parent, pupil, and school. They find that academic performance is the main determinant of parents' school choice, although home-school distance and accessible schools (based on admission criteria) may hinder the potential positive impact on competition.

There are, however, some important gaps in this literature – as noted by Gibbons and Silva (2011, p. 312): “Despite the importance of these issues, at present not much is known about what parents and children value in schools, and how parents weigh the benefits of academic excellence alongside other aspects of their child's wellbeing when judging school quality”. Five specific issues stand out:

1.1. Academic achievement

Previous research has found that academic performance is associated with parental satisfaction (Charbonneau & Van Ryzin, 2011; Gibbons & Silva, 2011; Chambers & Michelson, 2020; Milovanska-Farrington, 2022). For instance, Charbonneau and Van Ryzin (2011), using a single year of data from 900 public schools in New York, found that parental satisfaction is related with measures of school performance. However, while there is clear evidence that parental school satisfaction is associated with their children's academic achievement, limited research has previously considered how this varies by subject. Might parents place greater emphasis on the development of their offspring's mathematics skills rather than their literacy skills, for instance? Given that some studies have identified mathematical skills to be a stronger predictor of later achievement than reading skills (Duncan *et al.*, 2007; Claesens & Engel, 2013), this could be a possibility.

1.2. Rank effects

Second, although we know that children's *absolute* performance in academic tests matters to parents (Holmes, 2017), we do not know how they react to their child's performance as *relative* to their school or classroom peers. On the one hand, parents may be more satisfied with a school if their child is performing at the top of their class (even

if that class has, overall, below average levels of achievement). On the other hand, parents may be dissatisfied in such a situation, due to a feeling that the school is holding back their child by surrounding them with lower-achieving peers (i.e., their child may not be challenged enough in class). Little is currently known about such issues, despite recent research findings that being at the top of the class is positive for educational outcomes independent of students' underlying ability (Murphy & Weinhardt, 2020). Moreover, previous evidence suggests that many parents lack information to accurately judge the quality of the school their child attends (Favero & Meier, 2013)³. To the extent that it is easier to have a precise perception about academic performance within a reference group (i.e., school), than an absolute level of ability (Anderson *et al.*, 2006), we analyse the association of academic rank with parental school satisfaction.

1.3. Non-cognitive skills

Third, parents are also likely to value the wider developmental role that schools play, such as building children's character, socio-emotional skills, and resilience. However, is the development of such factors as strongly related to parental school satisfaction as the development of children's cognitive skills? Although research has examined parental attitudes towards non-cognitive aspects such as self-discipline (Alwin, 2001) or academic effort and perseverance (Elliott *et al.*, 2001; Tong, Li, & Shu, 2021), other relevant non-cognitive skills remain unexplored. In particular, we focus on parental views of the development of academic self-concept at school. This soft skill might be important to parents, to the extent that having a high self-concept yields strong benefits in academic accomplishment, such as academic performance (Hansen & Henderson, 2019) and occupational aspirations (Ireson & Hallam, 2009).

1.4. Well-being at school

Fourth, perhaps what really matters the most to parents is whether their child is happy at school, and whether the strength of the association between children's happiness at school and parental satisfaction is stronger than the analogous relationship with other factors (e.g., cognitive skills). However, few studies have empirically considered this issue using large-scale longitudinal data. In the United States, Jacob and Lefgren (2007) find that parents prefer teachers who promote student's satisfaction at school, rather than those promoting students' performance in standardised exams. Conversely, parental satisfaction in England does not seem to be associated with pupil happiness and wellbeing at school (Gibbons & Silva, 2011). We will try to achieve a better understanding of this issue, using student-reported measures about their well-being at school, focusing on their social integration.

1.5. Teacher-to-parent feedback

Finally, what tangible steps could schools and teachers take to improve parental satisfaction? Parental communication with the teacher and school is likely to be key (Ankrum, 2016). This is important, as previous research has found strong school-family relationships to significantly enhance academic achievement (Hampden-Thompson & Galindo, 2017) and homework completion (Kraft & Dougherty, 2013), and prevent drop-out rates (Kraft & Rogers, 2015). In this respect, Friedman, Bobrowski, and Markow (2007) found that teacher's communication, along with parental involvement in their child's education, were the most important factors predicting parental satisfaction, accounting for 41% of the variation. Yet, the particular relationship between teacher-to-

³ Other research argued that parents can choose the best schools for their children. Bast and Walberg (2004) established the hypothesis supporting this premise.

parent feedback and levels of school satisfaction remains underexplored.

1.6. Research questions and conceptual framework

This study attempts to fill these gaps in the existing evidence base. Using longitudinal administrative data from a region of Spain, we explore how a set of key factors are associated with parental satisfaction with schools. The rich array of available data allows us to control for more potentially confounding characteristics than is usually found in this literature, including children's prior achievement and attitudes, parents' historic levels of satisfaction with their child's school, and school fixed-effects. We are thus able to provide important new insights into what parents value about schools, investigating a set of issues that have previously received relatively little attention in the existing evidence base. Specifically, we seek to answer the following five research questions (RQ):

- RQ1. *Are children's mathematics and reading skills equally important for parental satisfaction with schools?*
- RQ2. *Is there an association between children's academic and socio-economic rank within the school and parental school satisfaction (net of their children's absolute academic abilities)?*
- RQ3. *Is the association between children's happiness at school and parental satisfaction stronger than the link between parental satisfaction and their children's academic abilities?*
- RQ4. *Is the link between children's socio-emotional development and parental school satisfaction stronger or weaker than the link with their academic skills?*
- RQ5. *Are parents more satisfied with a school when they receive more feedback about their child's progress?*

In our key findings, we find no evidence that mathematics or reading skills are more strongly associated with parental school satisfaction (RQ1). Both subjects seem to carry roughly equal weight. Similarly, the development of children's socio-emotional skills is just as strongly associated with parental school satisfaction as the development of cognitive skills (RQ4). Yet, what matters most to parents is their children's happiness at school, this being more strongly linked to parental satisfaction than any of the other key variables considered (RQ3). Interestingly, parents are somewhat less satisfied with schools when their child is more socio-economically advantaged than their school peers, and is conditional upon absolute levels of socio-economic status and academic ability (RQ2). Meanwhile, for schools and teachers looking to further enhance parental approval, providing regular feedback to parents about their children's progress is likely to be a key factor (RQ5).

To answer these research questions, the current study is framed within the conceptual model proposed by Friedman, Bobrowski, and Geraci (2006). The model indicates that parental evaluation of their children's school is based on several variables, including school administration (school management and budget); school facilities (computer technology and transportation); teachers' effectiveness; children's learning process and school experience (safety, curriculum, student achievement, classroom support of learning); and the role of the family in the learning process (communication with parents and parental involvement). However, there are certain characteristics that may influence the relative importance of these variables for parents, in particular, ethnicity, gender, and education. Therefore, parental experiences with their children's education are shaped by individual differences. Finally, the overall level of parental satisfaction with their children's school drives parents' school choice decisions, while

also influencing other parents' process of searching for their children's school through parents' referrals.

The remainder of this paper is structured as follows. Section 2 provides an overview of the dataset and our empirical methodology. Results are then presented in Section 3, followed by the discussion and conclusions in Section 4.

2. Data and methodology

2.1. Empirical setting

The empirical setting for this study is the Canary Islands, a large administrative region in Spain. The latest results from the OECD's Programme for International Student Assessment (PISA) reveal that students from the Canary Islands performed 15 points below the OECD average in reading, and 30 points below average in mathematics (MEFP, 2020a). This Spanish region has a particularly high proportion of students who do not have basic skills in mathematics. One-third of students performed below level 2 in mathematics in PISA 2018, compared to approximately one-fifth of Spanish students in general, and students across the OECD.

The socioeconomic context of the Canary Islands also exhibits higher levels of deprivation compared to the rest of the country. For instance, per capita income was 9,487€ in 2019 (3,000€ under the Spanish average). A snapshot of the socioeconomic context of the Canary Islands compared to the rest of Spain, and the OECD is shown in Table C.1 (Appendix C). The Index of Economic, Social and Cultural status obtained from PISA 2018 data is 0.4 points below the OECD average in the Canary Islands, and 0.3 points below the rest of Spain. The school social makeup is slightly different, with a higher proportion of immigrant students than other Spanish regions (3% more immigrant students in the Canary Islands). Meanwhile, the high unemployment rate of the Spanish labour market is more stressed in the Canary Islands, where it rose to 20% (5 points above the Spanish average) in 2018. Similarly, the gender gap in employment is remarkable in Spain and the Canary Islands, as compared to the OECD average. The unemployment rate in Spain is approximately 4 percent points higher for women (than men), while in the OECD the gap is, on average, less than 1%. In the context of the European Union, this region is classified as a *transition region* and, apart from receiving funds under the cohesion policy, it also receives special funding for the outermost regions. Given these rather high levels of deprivation, along with low levels of achievement in mathematics, this context is particularly interesting to explore the correlates of parental satisfaction with schools.

The school admission process in the Canary Islands follows the admission criteria established at the national level (Organic Law 2/2006 of Education)⁴, and specified in the regional legislation (Decree 61/2007)⁵. The admission criteria give enrolment priority to children: a) who have siblings attending the same school, b) who have parents working at the same school, c) who live in the school catchment area or a boundary area, d) whose parents work in the school catchment area or in a boundary area, e) from a low-income family, f) who have a disability, or have parents or siblings with some kind of disability, g) who belong to a "large family" (with three or more children). These criteria apply to

⁴ "Ley Orgánica 2/2006, de 3 de mayo, de Educación, Título II, Capítulo III" is devoted to the national school admission process.

⁵ "Decreto 61/2007, de 26 de marzo, por el que se regula la admisión del alumnado de enseñanzas no universitarias en los centros docentes públicos y privados concertados de la Comunidad Autónoma de Canarias, Capítulo III" specifies the regional school admission criteria.

publicly funded schools, while private schools establish their own admission process. Unfortunately, we do not have information about the admission process or parental school preferences for private schools. In this regard, the island where the school is located is the only data available.

According to the 2018 PISA data, in the Canary Islands, 88% of students attended schools where school admission is essentially⁶ based on place of residence, which is much higher than the Spanish and OECD average – 81% and 59%, respectively (MEFP, 2020b). This result reveals that parents have limited choice of schools in the region. Therefore, school competition in the Canary Islands may take place mainly within catchment areas. The small number of schools within catchment areas also reduces school competition. In the academic year 2011-12, this region had the lowest percentage of catchment areas with two or more schools in Spain (OECD, 2012). Meanwhile, parents tend to apply to schools within their catchment area. In fact, in 2011-12 only 4% of parents filed an out-of-area application (OECD, 2012). However, it is unknown whether this is due to parental preferences or remote possibilities of being accepted outside the designated area. This lack of school competition can also be attributed to the Island’s geography.

2.2. Data overview

Our data are drawn from a longitudinal census of students, following a cohort of 3rd grade primary school students ($n = 20,118$) in the academic year 2015-16, until their 6th grade ($n = 19,871$) in 2018-19. In total, 15,739 students were followed from 3rd to 6th grade. Of these, 14,140 pupils completed a standardised external test in reading and mathematics as part of a regional assessment programme in 6th grade, and 14,110 took the test in 3rd grade. In addition, students and parents were asked to complete a questionnaire. In the 3rd grade, 12,402 students (79%) and 11,447 parents (73%) responded to the questionnaire; 13,340 students (85%) and 10,841 parents (69%) responded in 6th grade⁷. The final sample consisted of a total of 9,918 students across 463 schools. A summary of the size of the cohort and data availability can be found in Table C.2 (Appendix C).

To account for no-response, we model the probability of selection into our sample using logistic regression, and then create a set of Inverse Probability Weights that we apply throughout our analysis (See Appendix A for further details). Missing covariate data has been dealt with by including missing dummy flags.

Parental satisfaction with schools and teachers (outcome variable)

As part of the 3rd and 6th grade questionnaires, parents were asked the following question to capture their satisfaction with schools using a five-point scale (“not at all satisfied” to “very satisfied”).

“Please indicate your degree of satisfaction with the following aspects of your child’s school”.

- Teachers
- School management
- Work in the classroom
- Relationship with the teacher (academic tutor)

⁶ The school principal stated that school admission based on residence is used “always” or “sometimes”.

⁷ In addition, a further 923 observations are dropped from our analysis when our analytic models include school fixed-effects, due to a lack of variability in the outcomes.

- Classmates
- Use of resources
- Learning level
- School climate
- Overall rating of the school

Parents were also asked five questions about their child’s class teacher, and had to rate their attributes using a four-point scale (“not at all satisfied” to “very satisfied”):

- Motivation and enthusiasm
- Cordiality and closeness
- Working capacity
- Communication
- Flexibility and patience

A summary of parents’ answers to these questions can be found in Table 1, which shows that parents generally reported high levels of satisfaction with their children’s teachers and schools.

<< Table 1 >>

Using parents’ answers to these questions, we construct a “parental satisfaction with school” scale and a “parental satisfaction with class teacher” scale. Specifically, we conduct a polychoric principal component analysis⁸ (PCA), with the first component⁹ used to form the scale. These indexes have then been standardised to have mean 0 and standard deviation 1. A histogram illustrating the distribution of these scales can be found in Figure 1. Given the high ratings reported by parents, these indices are strongly skewed left. In other words, Figure 1 suggests that these scales may suffer from potential ceiling effects.

<< Figure 1 >>

Given the left-skew of the scales, we decided to focus on factors associated with parental *dissatisfaction* with children’s schools and teachers. Parents are classified as “dissatisfied” with their children’s school/teacher when they belong to the bottom 20% of each scale – coded 1 – and 0 otherwise. A series of logistic regression models are then used to address our research questions, as given below.

2.3. Empirical methodology

In this section, we describe the models that have been specified, to answer the five research questions under analysis.

RQ1. Are children’s mathematics and reading skills equally important for parental satisfaction with schools?

To measure students’ test scores in reading and mathematics, we use the results of the reading and mathematics tests administered to the census of Canarian students, which are consistent across schools, and graded externally. We then estimate the following baseline logistic regression model:

⁸ The reliability of the indexes using Cronbach’s Alpha are 0.92 (satisfaction with school) and 0.95 (satisfaction with teacher), respectively.

⁹ The percentage of the variance explained by the first component is: 62.16% (satisfaction with the school) and 84.35% (satisfaction with teacher), respectively.

$$\log\left(\frac{\pi(LPS_{ij}^6)}{1-\pi(LPS_{ij}^6)}\right) = \alpha + \gamma S_{ij} + \delta Q_{ij}^6 + \beta_1 M_{ij}^6 + \beta_2 R_{ij}^6 + \mu_j + \varepsilon_{ij} \quad (1)$$

where:

LPS_{ij}^6 = Whether the parent was dissatisfied with the school or teacher in 6th grade.

S_{ij} = A vector of students' characteristics: sex (reference: male), immigrant status (reference: native, Spanish), socio-economic status index.

Q_{ij}^6 = Respondent to the 6th grade parental questionnaire (mother, father, and others).

M_{ij}^6 = Students' mathematics 6th grade test scores (standardised to have mean 0 and standard deviation 1).

R_{ij}^6 = Students' reading 6th grade test scores (standardised to have mean 0 and standard deviation 1).

μ_j = School fixed-effects.

i = Student i .

j = School j .

ε_{ij} = the idiosyncratic error term.

To answer research question 1, we tested the hypothesis of whether $\beta_1 = \beta_2$, that is, whether the strength of the association between mathematics test scores and parental school satisfaction were the same as the strength of the association between reading test scores and parental school satisfaction.

To take advantage of the longitudinal data, we estimate two further model specifications where we add students' mathematics/reading test scores and levels of parental school satisfaction in the 3rd grade. Estimates from these models will illustrate the relative strength of the association between reading/mathematics test scores and parental school satisfaction, among students who attend the same school, have similar demographic characteristics, had similar mathematics and reading test scores in Grade 3, and whose parents had similar levels of parental satisfaction with their school (or teacher) in the third grade.

RQ2. Is there an association between children's academic and socio-economic rank within the school and parents' school satisfaction (net of their children's absolute academic abilities)?

To measure students' academic rank within their school, we draw upon how their mathematics scores compare to their peers. Specifically, we divide the mathematics test score distribution¹⁰ within each school into deciles. A value of 10 on this variable thus indicates that a student is in the top 10% of students in the school (in mathematics), and a value of 1 means the student is in the bottom 10%. This variable is only created at schools where test scores in mathematics were available for 10 students or more¹¹ (396 students were excluded).

We also measured students' *relative* socio-economic status within their school in a similar way. Within our data, students' socio-economic backgrounds were measured

¹⁰ As a robustness check, we used reading test scores distribution within each school, instead of mathematics test scores.

¹¹ This variable is based on the full sample of students who took the test in mathematics in 6th grade.

using the Economic, Social and Cultural Status (ESCS) index – similar to the construct used in PISA. It is a continuous, composite measure, combining information on parental education, occupation, income, household possessions, and the number of books at home. To measure relative socio-economic position, we divide students into socio-economic deciles within their school, taking a value of 1 if the student belonged to the most disadvantaged 10% students in their school, and a value of 10 if they were among the most advantaged 10%. This variable has been created only at schools where the socio-economic status (SES) measure is available for 10 students or more (224 students were excluded).

We then enter these variables into a model of the form:

$$\log\left(\frac{\pi(LPS_{ij}^6)}{1-\pi(LPS_{ij}^6)}\right) = \alpha + \varphi_1 A_RANK_{ij}^6 + \varphi_2 SES_RANK_{ij}^6 + \gamma S_{ij} + \delta Q_{ij}^6 + \beta_1 M_{ij}^6 + \beta_2 R_{ij}^6 + \vartheta_1 M_{ij}^3 + \vartheta_2 R_{ij}^3 + \rho PS_{ij}^3 + \varepsilon_{ij} \quad (2)$$

where:

$A_RANK_{ij}^6$ = The academic rank (decile) of the child within their school in the 6th grade.

$SES_RANK_{ij}^6$ = The socio-economic rank (decile) of the child within their school in the 6th grade.

All other variables are specified as under RQ1, in the subsection above.

The parameter of interest from these models is φ_1 . This captures the change in parental school satisfaction for a one decile increase in a student's within-school academic rank (conditional upon the other factors included in the model – including their absolute level of academic achievement). Two specifications of this model are estimated (including/excluding students socio-economic rank within school – $SES_RANK_{ij}^6$), to investigate whether students' relative socio-economic positions (rather than their relative academic position) might be driving our results.

RQ3. Is the association between children's happiness at school and parental satisfaction stronger than the link between parental satisfaction and their children's academic abilities?

In the background questionnaire, students were asked to respond to the following statements about their life at school:

- I make friends.
- I feel comfortable in my class.
- My classmates keep me out from their games.
- I am afraid of some mates.
- I like stay at school.
- I feel safe at school.
- I feel part of the school.
- I like to see my classmates.

Responses were provided using a four-point scale (“do not agree” to “fully agree”). A principal components analysis has been used to turn students' responses to these statements into a continuous scale (Cronbach's alpha = 0.70 in 3rd grade and 0.78 in 6th grade). This scale has been included into a model of the form:

$$\log\left(\frac{\pi(LPS_{ij}^6)}{1-\pi(LPS_{ij}^6)}\right) = \alpha + \beta_1 Happy_{ij}^6 + \beta_2 A_{ij}^6 + \gamma S_{ij} + \delta Q_{ij}^6 + \vartheta_1 M^3_{ij} + \vartheta_2 R^3_{ij} + \rho PS_{ij}^3 + \mu_j + \varepsilon_{ij} \quad (3)$$

where:

$Happy_{ij}^6$ = The student happiness at school scale, standardised to have mean 0 and standard deviation 1.

A_{ij}^6 = The average of students' mathematics and reading test scores in the 6th grade, standardised to have mean 0 and standard deviation 1.

With all other variables specified as under RQ1 above.

The parameter of interest from this model is β_1 , which is the strength of the association between children's happiness at school and parental satisfaction. We are particularly interested in the comparison of β_1 with β_2 , which shows whether the link between children's happiness at school and parental satisfaction is stronger than the link between children's academic achievement and parental satisfaction with school. Again, we must investigate the sensitivity of the results to different model specifications, including the addition/exclusion of measures of children's happiness at school and academic achievement score in grade 3. Estimates from the final specification will thus refer to the association between children's happiness and parental satisfaction with school in grade 6, for children with the same background characteristics, attending the same school and who had similar levels of prior academic achievement, happiness at school and parental school satisfaction levels at the end of grade 3.

RQ4. Is the link between children's socio-emotional development and parental school satisfaction stronger or weaker than the link with their academic skills?

In addressing this research question, we focus upon one key socio-emotional trait – students' academic self-concept. This was measured in the student questionnaire through the following statements, with students responding using a four-point scale (“never” to “almost always”):

- I am good at mathematics.
- Mathematics is harder for me than my classmates.
- Mathematics is more difficult than other subjects.
- I like studying mathematics.

Unlike other measures, these statements were only made to the 6th grade. PCA was again used to convert student responses into a scale (Cronbach alpha = 0.74) which has been standardised to have a mean value of 0 and standard deviation of 1.

This scale has been included into a model of the form:

$$\log\left(\frac{\pi(LPS_{ij}^6)}{1-\pi(LPS_{ij}^6)}\right) = \alpha + \beta_1 SC_{ij}^6 + \beta_2 A_{ij}^6 + \gamma S_{ij} + \delta Q_{ij}^6 + \vartheta_1 M^3_{ij} + \vartheta_2 R^3_{ij} + \rho PS_{ij}^3 + \mu_j + \varepsilon_{ij} \quad (4)$$

where:

SC_{ij}^6 = The mathematics self-concept scale, with all other variables defined as under RQ3 above.

Our primary interest is β_1 (the link between students' self-concept and parents' satisfaction with school) and how this compares to β_2 (the link between cognitive skills and parental satisfaction with school).

As a robustness check, instead of using kids' self-confidence in mathematics, we have used self-confidence in reading. This scale is based on the responses to the following statements:

- I am good at reading.
- Reading is harder for me than my classmates.
- Reading is more difficult than other subjects.
- I like reading.

PCA has again been used to convert student responses into a scale (Cronbach alpha = 0.56), which has been standardised to have mean 0 and standard deviation 1.

RQ5. Are parents more satisfied with a school when they receive more feedback about their child's progress?

Within the parental 3rd and 6th grade questionnaire, the responding parent was asked about the frequency at which they discussed the following issues with their child's teacher, using a four-point scale ("never" to "almost always"):

- School grades obtained.
- Difficulties with the learning level and how to solve them.
- Behaviour in the classroom.
- Aspects associated with classroom behaviour which affect their child.
- Relationships with other classmates.

A parental feedback scale was then created (via PCA), which was standardised to have a mean value of 0 and, standard deviation of 1. This scale has been included into a model of the form:

$$\log\left(\frac{\pi(LPS_{ij}^6)}{1-\pi(LPS_{ij}^6)}\right) = \alpha + \beta_1 F_{ij}^6 + \beta_2 A_{ij}^6 + \gamma S_{ij} + \delta Q_{ij}^6 + \vartheta_1 M^3_{ij} + \vartheta_2 R^3_{ij} + \rho PS_{ij}^3 + \mu_j + \varepsilon_{ij} \quad (5)$$

where:

F_{ij}^6 = The frequency that teachers provide feedback to parents, with all other variables defined as under RQ3 above.

The magnitude of the β_1 parameter will capture the extent to which the teacher feedback in Grade 6 is related to parental school satisfaction. Note that, in the most complete model specification, these results will be conditional upon teacher feedback and parental school satisfaction in Grade 3, in addition to a host of other controls.

3. Results

3.1. Do parents value the performance in either reading or mathematics more than the other?

Table 2 (M1) models low parental satisfaction with the school/teacher as a function of test scores in reading and mathematics, controlling for socio-demographic factors. Column 2 (M2) adds additional controls for the level of parental satisfaction in 3rd grade, and column 3 (M3) also controls for previous academic performance (reading

and mathematics test scores in 3rd grade). Estimates are presented as odds-ratios. Appendix B and the online supplementary appendix present alternatives as average marginal effects and as log-odds.

The results show that higher test scores are associated with less parental dissatisfaction with their child's school (panel a) and teacher (panel b). In particular, a one standard deviation increase in mathematics scores reduces the odds of parental dissatisfaction with the school by a factor of 0.9. This holds true across all model specifications, and for both our outcome measures. This is equivalent to an average marginal effect of 1.5 percentage points for both reading and mathematics. In this sense, our evidence is in line with the results stated by Burgess *et al.* (2015), or Charbonneau and Van Ryzin (2012), among others.

With respect to RQ1, we tested the equality of the reading and mathematics test score coefficients and found the difference to be statistically insignificant. We are therefore unable to reject the null hypothesis that children's reading and mathematics achievement is equally important for parental (dis)satisfaction with their offspring's teacher and school. Thus, although parental satisfaction is correlated with their children's academic achievement, it does not vary by subject.

<< Table 2 >>

3.2. Do parents care about relative performance (to other pupils in school) as well as absolute performance?

Table 3 illustrates whether children's academic rank and socio-economic rank within their school is linked to parental satisfaction. Note that the "rank" variables of interest are coded from the lowest decile (1) to the highest decile (10). This means that positive coefficients indicate an increase in academic/socio-economic rank, and is associated with higher levels of dissatisfaction with schools and teachers.

The estimates from model M1 indicate that a one decile increase in rank position (e.g., a child moving from the 10th to 20th academic decile within their school) is associated with a 1.04 increase in the odds of parents being dissatisfied with their child's school. Conversely, the link between academic rank and parental satisfaction with their child's teacher is smaller (odds ratio = 1.02) and not statistically significant.

Regarding the effect of relative socioeconomic status, Table 3 illustrates that when a child is more socio-economically advantaged than their peers, the parental satisfaction level is reduced (over and above their absolute socioeconomic status level). The magnitude of the coefficient implies that a one rank improvement is associated with a 1.05 increase in the odds of having a low level of parental satisfaction with the school (M2 in Table 3a). In terms of average marginal effects, this means that an increase in each decile of a child's relative socio-economic position within their school is associated with a one percentage point increase in the probability that their parents are dissatisfied with their school. There is, however, little evidence that the relative socio-economic status is linked to parental satisfaction with their child's teacher (M2 in Table 3b).

The final specification (M4) includes both academic and socio-economic rank in the model at the same time. The estimates for academic rank are no longer statistically significant in this model specification. Yet, the estimates for relative socio-economic status remain largely unchanged (odds ratio = 1.05, even after conditioning by academic rank). In other words, our finding that relative socio-economic status is linked to parental dissatisfaction with schools does not seem to be driven by the differences in their children's relative academic position.

As a robustness check, we have ranked students in terms of reading test scores within their school. The results are consistent with students' relative position in terms of mathematics, but with slightly lower association with parental satisfaction (log-odds coefficients available in Appendix D, Tables D1 and D2).

<< Table 3 >>

3.3. What is more important for parental satisfaction with school, their children's academic progress or their children's happiness?

Table 4 illustrates the link between student happiness at school score and parental satisfaction with the school and teacher. As expected, the results show that when their child is unhappy, parents are more likely to express dissatisfaction. Specifically, each standard deviation increase in student happiness at school is associated with a 30 percent decrease in parents being dissatisfied with the school (odds ratio ~ 0.7). This holds true across model specifications. In terms of average marginal effects, this implies that each standard deviation in children's happiness is associated with a decrease of six percentage points in parental dissatisfaction. A slightly weaker association is observed in parental satisfaction with the child's teacher (odds ratio ~ 0.8).

Our third research question asked whether the association between parental satisfaction was more strongly linked with their children's happiness at school, or their academic abilities. Table 4 suggests that the former is more important than the latter¹². In particular, the odds ratio for a one standard deviation increase in student happiness (~ 0.7) is clearly more strongly associated with our outcome, than a one standard deviation increase in academic abilities (~ 0.85). Hence, these results support the estimates reported by Jacob and Lefgren (2007) (in the context of the United States), which state the relevance of promoting student's satisfaction at school rather than promoting their performance on standardised exams. This result is conditional on parental satisfaction with the school (M2), standardised test scores (M3) and student happiness at school scores in 3rd grade (M4). Broadly similar results hold for parental dissatisfaction with their child's teacher, as well.

<< Table 4 >>

3.4. What is more important for parental satisfaction with school, their children's academic progress or development of their socio-emotional skills (e.g., self-confidence)?

Table 5 addresses this research question. There is little evidence that cognitive skills are more strongly associated with parental satisfaction with school than non-cognitive skills (or vice-versa). In particular, the estimated odds ratio for a standard deviation increase in both achievement scores and the self-confidence scale are very similar (e.g., 0.89 versus 0.86 in model M3 for school satisfaction). Indeed, when testing the equality of the coefficients, we found no significant difference between them¹³. A similar finding holds true with respect to parental satisfaction with their child's teacher.

¹² The tests for difference of coefficients reject the null hypothesis of equality of coefficients in Table 4 for all the specifications (H_0 : Academic achievement score grade 6 = Student happiness at school score grade 6). The p-values of the test for each specification are: 0.00 for all specifications in panel a (M1, M2, M3 and M4); 0.007 (panel b, M1); 0.00 (panel b, M2, M3 and M4).

¹³ The tests for difference of coefficients accept the null hypothesis in Table 5 for all the specifications. (H_0 : Academic achievement score grade 6 = Student math self-confidence grade 6). The p-values of the test for each specification are: 0.98 (M1, panel a), 0.75 (M2, panel a), 0.48 (M3, panel a), 0.11 (M1, panel b), 0.57 (M2, panel b) and 0.59 (M3, panel b).

It thus seems that cognitive and non-cognitive skills are equally important for parental satisfaction.

<< Table 5 >>

To check for the robustness of our results, we have measured non-cognitive skills using students' self-confidence in reading. For some specifications, the tests reject the equality of the coefficient of cognitive and non-cognitive skills when using the reading self-confidence scale, highlighting that cognitive skills seem more important for parental satisfaction than non-cognitive skills. Results are available in Tables D3 and D4 (Appendix D)¹⁴.

3.5. Are parents more satisfied when they receive more feedback about their child's progress?

Results in Table 6 show that the more information parents receive about their child's progress, the lower the likelihood of them having a low satisfaction with the school/teacher. Concretely, a one standard deviation increase in parental feedback reduces the odds of parents expressing dissatisfaction with the teacher/school by a factor of approximately 0.9, and is statistically significant at the five percent level. This holds true across various model specifications, including after controlling for a prior measure of parent satisfaction with the school in 3rd grade (M2), feedback about the child's progress in 3rd grade (M3), academic performance in 6th grade (M4), as well as a rich set of background controls and school fixed-effects.

<< Table 6 >>

4. Discussion and conclusions

This research has delved into the factors that explain parental satisfaction with their children's school and teacher, using administrative data from Spain. Our rich longitudinal data – describing various aspects of children's schooling, measured approximately three years apart – has enabled us to explore factors associated with changes in parental satisfaction over time (between 3rd and 6th grades). This allows us to reduce the importance of other unobservable factors which could influence parental satisfaction. Thus, we have been able to provide new and important empirical evidence into what parents value about schools, investigating a set of issues that have previously received scarce attention in the existing research. Particularly, we have explored the importance of mathematics and reading skills for parental satisfaction with the school, the potential association between children's academic and socio-economic ranks within the school and parental school satisfaction, the differences in the association between children's happiness at school and their academic abilities with parental satisfaction, the differences in the link between children's socio-emotional development and their academic skills with parental school satisfaction, and the relationship between parents' satisfaction with the school and receiving more feedback about their child's progress.

We have found that achievements in reading and mathematics are equally important determinants of parental (dis)satisfaction with teachers and schools. Likewise, the strength of the association between children's non-cognitive skills and parental dissatisfaction is roughly the same as the strength of the relationship with their cognitive skills. In particular, children's self-concept is as important for parental satisfaction as their

¹⁴ P-values for the test of equality of coefficients (H_0 : Academic achievement score grade 6 = Student reading self-confidence grade 6) for each specification are: 0.0054 (M1, Table E3), 0.0092 (M2, Table E3), 0.0787 (M3, Table E3), 0.0338 (M1, Table E4), 0.4726 (M2, Table E4) and 0.5545 (M3, Table E4).

academic performance. In contrast, how the child's happiness at school has a much stronger link with parental satisfaction with their child's education provider, than the child's academic abilities. This result contradicts Gibbons and Silva's finding (2011) for secondary school students in England. This could be due to cultural differences between Spain and England, school grade (secondary school vs primary school) or the set variables used to measure child happiness¹⁵. In this regard, our measure of child happiness is related to social integration and peer support at school. According to Danielsen *et al.* (2009), classmate support is a dimension of children's happiness at school, along with teacher and parent support. Therefore, we partially capture child happiness at school, to the extent that our measure is more focused on social integration than on the latter dimensions or on academic engagement. Furthermore, parents are somewhat less satisfied with schools when their child is more socio-economically advantaged than their school peers, conditional upon absolute levels of socio-economic status and academic ability. Finally, we also find robust evidence that regular feedback from schools to parents about their child's progress leads to greater levels of parental satisfaction with the school (and teachers), as highlighted by authors such as Friedman, Bobrowski, and Markow (2007) and Ankrum (2016), among others. Friedman, Bobrowski, and Markow (2007), specifically, identified five sources of parental satisfaction in the United States, the main one being receiving information from the school about their children. Furthermore, our results support the theoretical framework proposed by Bronfenbrenner (1979) (the ecological system theory): the quality of interaction between schools and parents has relevant consequences on student development.

Last, but not least, following the taxonomy published by Vincent (1996) to characterise the roles that parents can present regarding involvement in their children's education, our results show that the parents surveyed in our dataset could be classified as being between the "supporter-learner parents group" and the "parents as participants". We select this mixed classification because, on the one hand, we look for parents who support teachers as the professionals responsible for their children's education, focusing on their individual children and extracurricular activities, and on the other hand, parents involved in school governance, as well as their child's education, who express their concerns for quality education. Therefore, communication between home and school is relevant to them, as opposed to the "independent parents", who maintain minimum contact with the school and "parent as consumers", who express themselves by choosing school and optimise the legal provision for open enrolment.

These findings should be considered in light of the study's limitations. First, our measures of children's cognitive abilities have focused on reading and mathematics. We do not know if similar findings would emerge with respect to other subject areas (e.g., artistic abilities). Second, some socio-emotional skills are also likely to be more important than others. Yet, our research has focused on children's self-efficacy in particular subject areas. Future work should seek to investigate the link between parental school satisfaction and the development of a broader range of young people's socio-emotional skills. Third, our measure of child happiness is related to peer support at school, and does not account for teachers' and parents' support, which may also be important to measure students' happiness at school. Fourth, as with any observational study, our estimates only capture conditional associations and may not reflect cause and effect. Fifth, due to the potential ceiling effects in our outcome measure, our analysis has focused on associations with

¹⁵ Gibbons and Silva (2011) used the following questions to measure pupil wellbeing: unhappiness at school ("I am happy when I am at school"), boredom in lessons ("I am bored in lessons") and disliking teachers ("I like my teachers") answered with a four-point scale (strongly agree to strongly disagree).

parental *dissatisfaction* with schools. Finally, the data have been drawn from one administrative region in Spain. The external validity of our findings, with respect to other countries, is not known. Hence, future studies must consider generalising our findings to other national settings.

Despite these limitations, our results indicate that parental satisfaction is linked to their child's diverse experiences at school. Parents certainly care about their child's academic progress, but the development of their child's self-confidence and happiness at school are equally, or perhaps, more important. This information is valuable for school leaders and teachers who are always under increasing pressure to meet parental needs. Meanwhile, in the particular context of the Canary Islands the low level of parental involvement at school has been attributed to the fact that parents are not seen as equal partners in their children's school (OECD, 2012). This finding, along with a lack of communication between parents and teachers – also identified in this region –, could have negative consequences on the levels of educational attainment. In this sense, strengthening teacher-parent relationships should be considered a key issue for the development of schools as learning communities (Schussler, 2003). Teachers should thus receive specific training in how to effectively communicate with parents, so that families feel closely involved in the education process, without losing sight of pupil achievement. Indeed, schools should be a natural point of interaction between teachers and parents.

Some practical implications should be aimed at helping children feel happy and safe at school, including handling issues such as bullying. To achieve this, schools should promote activities such as specialised workshops for parents on various topics ranging from child development to emotional development, stress management, and self-confidence. Additionally, schools could promote the participation of parents in school projects and/or support mentorship programs. It is also vital that any cultural barriers between teachers and parents be overcome by celebrating their students' cultural traditions, and by seeking to understand each family's particular situation. Parent-teacher interaction is also relevant to enable parents to better understand their children's strengths and weaknesses. They may also be able to provide feedback to teachers regarding what they observe about their own child, so that the former can make necessary adjustments to their teaching methods. However, it is obvious that even well-designed programs encouraging the involvement of parents would have limited success, if parents do not think that attending such events actively promotes the values they wish to transmit to their children.

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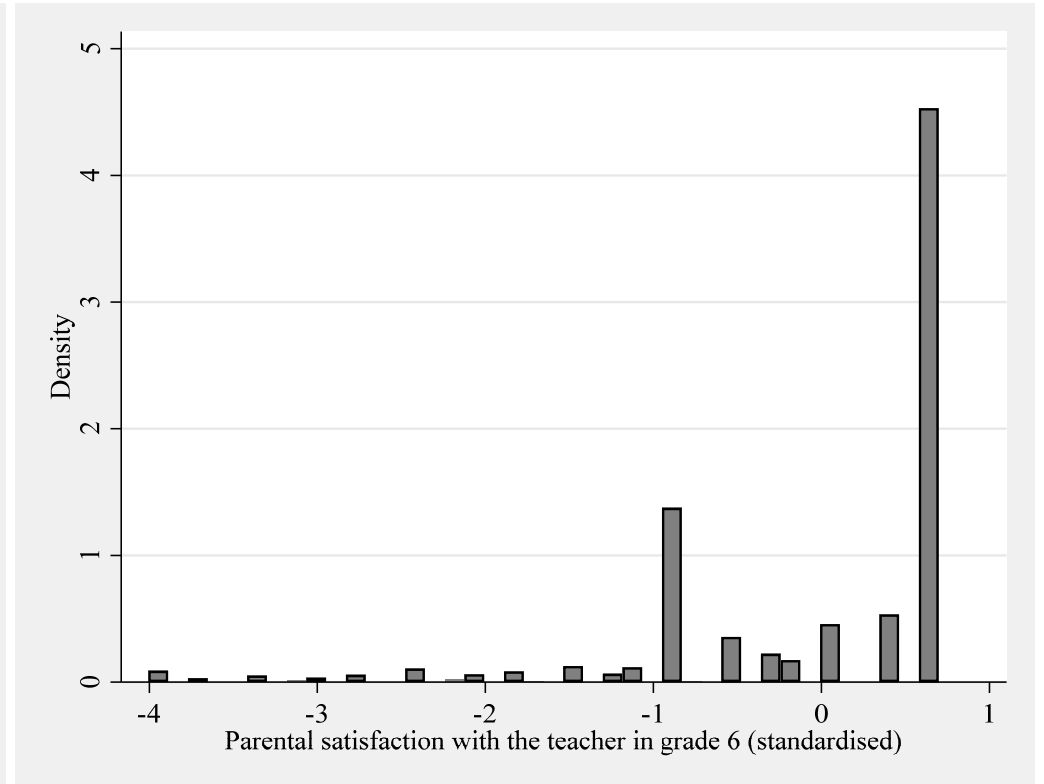
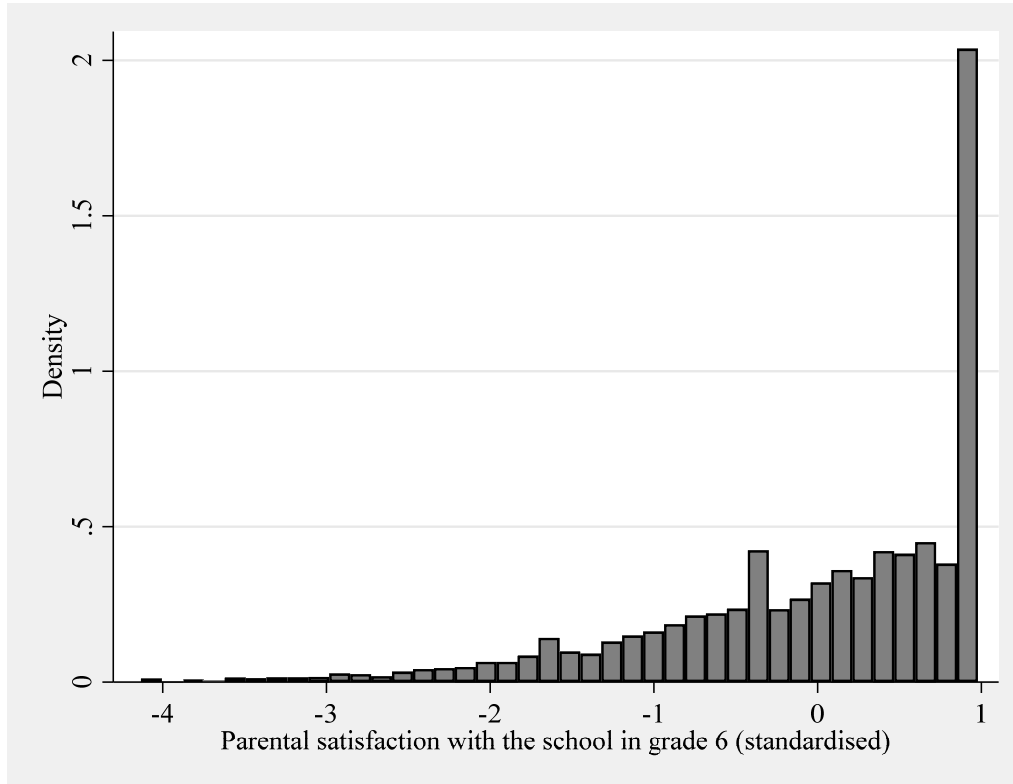
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Figure 1. The distribution of the parental satisfaction with school and teacher scale in grade 6

(a) Satisfaction with school

(b) Satisfaction with teacher



Source: Authors' own calculations

Table 1. The distribution of parental satisfaction with schools and teachers in 6th grade (column percentage)

(a) Schools

	Teachers	School management	Work in classroom	Relationship with the academic tutor	Classmates	Use of resources	Learning level	School climate	Overall rating
1 (not at all satisfied)	2	5	2	2	2	3	3	2	3
2	4	6	5	4	4	6	6	5	4
3	13	14	14	9	14	18	15	14	14
4	25	24	29	19	31	31	30	30	29
5 (very satisfied)	55	51	50	66	49	42	46	49	50
Total	100	100	100	100	100	100	100	100	100

(b) Teachers

	Motivation and enthusiasm	Cordiality and closeness	Working capacity	Communication facility	Flexibility and patience
1 (not at all satisfied)	4	3	2	3	4
2	5	4	4	4	5
3	31	28	32	28	30
4 (very satisfied)	61	65	62	65	62
Total	100	100	100	100	100

Note: Average weights have been applied. Number of observations: 9,918.

Source: Authors' own calculations.

Table 2. The association between cognitive test scores and parental dissatisfaction with schools and teachers (odds ratios). Research question 1

(a) Satisfaction with schools

Variables	M1	M2	M3
Grade 6 reading scores	0.89*	0.90*	0.92*
Grade 6 maths scores	0.87*	0.87*	0.91*
Controls			
Gender	Y	Y	Y
Socio-economic status	Y	Y	Y
Immigrant status	Y	Y	Y
Questionnaire respondent	Y	Y	Y
Satisfaction grade 3	-	Y	Y
Grade 3 reading and maths scores	-	-	Y
Location at grade 3	Y	Y	Y
School fixed effects	Y	Y	Y
Observations	9,918	9,918	9,918

(b) Satisfaction with teachers

Variables	M1	M2	M3
Grade 6 reading scores	0.88*	0.91*	0.92*
Grade 6 maths scores	0.91*	0.97	0.98
Controls			
Gender	Y	Y	Y
Socio-economic status	Y	Y	Y
Immigrant status	Y	Y	Y
Questionnaire respondent	Y	Y	Y
Grade 3 reading and maths scores	-	Y	Y
Satisfaction grade 3	-	-	Y
Location at grade 3	Y	Y	Y
School fixed effects	Y	Y	Y
Observations	9,918	9,918	9,918

Dependent variable: Low parental satisfaction with the school (grade 6) takes the value “1” for the bottom quintile of the scale and “0” otherwise.

Method of estimation: Maximum Likelihood. Logit regression model. Weights have been applied. Figures refer to odds ratios. For full set of parameter estimates (in log-odds) see Online Supplementary Appendix Tables S1 and S2.

* significant at 5%

Source: Authors’ own calculations.

Table 3. The association between relative academic rank, relative socio-economic status and parental dissatisfaction with schools/teachers (odds ratios). Research question 2

(a) Satisfaction with schools

Variables	M1	M2	M3	M4
Academic rank grade 6	1.04*	-	1.03	1.03
SES rank grade 6	-	1.05*	1.05*	1.04*
Controls				
Academic rank grade 3	-	-	-	Y
Gender	Y	Y	Y	Y
Socio-economic status	Y	Y	Y	Y
Immigrant status	Y	Y	Y	Y
Questionnaire respondent	Y	Y	Y	Y
Satisfaction grade 3	Y	Y	Y	Y
Grade 3 reading and maths scores	Y	Y	Y	Y
Location at grade 3	Y	Y	Y	Y
Observations	9,918	9,918	9,918	9,918

(b) Satisfaction with teachers

Variables	M1	M2	M3	M4
Academic rank grade 6	1.02	-	1.02	1.03
SES rank grade 6	-	1.02	1.01	1.01
Controls				
Academic rank grade 3	-	-	-	Y
Gender	Y	Y	Y	Y
Socio-economic status	Y	Y	Y	Y
Immigrant status	Y	Y	Y	Y
Questionnaire respondent	Y	Y	Y	Y
Grade 3 reading and maths scores	Y	Y	Y	Y
Satisfaction grade 3	Y	Y	Y	Y
Location at grade 3	Y	Y	Y	Y
Observations	9,918	9,918	9,918	9,918

Dependent variable: Low parental satisfaction with the school (grade 6) takes the value “1” for the bottom quintile of the scale and “0” otherwise.

Method of estimation: Maximum Likelihood. Logit regression model.

Weights have been applied. Figures refer to odds ratios. For full set of parameter estimates (in log-odds) see Online Supplementary Appendix Tables S3 and S4.

* significant at 5%

Source: Authors’ own calculations.

Table 4. The association between academic achievement, students' happiness at school and parental dissatisfaction with schools/teachers (odds ratios). Research question 3

(a) Satisfaction with schools

Variables	M1	M2	M3	M4
Academic achievement grade 6	0.83*	0.84*	0.88*	0.88*
Student happiness grade 6	0.67*	0.69*	0.70*	0.70*
Controls				
Gender	Y	Y	Y	Y
Socio-economic status	Y	Y	Y	Y
Immigrant status	Y	Y	Y	Y
Questionnaire respondent	Y	Y	Y	Y
Parental satisfaction grade 3	-	Y	Y	Y
Grade 3 reading and maths scores	-	-	Y	Y
Student happiness grade 3	-	-	-	Y
Location at grade 3	Y	Y	Y	Y
School fixed effects	Y	Y	Y	Y
Observations	9,918	9,918	9,918	9,918

(b) Satisfaction with teachers

Variables	M1	M2	M3	M4
Academic achievement grade 6	0.86*	0.92*	0.93*	0.93*
Student happiness grade 6	0.76*	0.77*	0.77*	0.78*
Controls				
Gender	Y	Y	Y	Y
Socio-economic status	Y	Y	Y	Y
Immigrant status	Y	Y	Y	Y
Questionnaire respondent	Y	Y	Y	Y
Grade 3 reading and maths scores	-	Y	Y	Y
Parental satisfaction grade 3	-	-	Y	Y
Student happiness grade 3	-	-	-	Y
Location at grade 3	Y	Y	Y	Y
School fixed effects	Y	Y	Y	Y
Observations	9,918	9,918	9,918	9,918

Dependent variable: Low parental satisfaction with the school (grade 6) takes the value “1” for the bottom quintile of the scale and “0” otherwise.

Method of estimation: Maximum Likelihood. Logit regression model.

Weights have been applied. Figures refer to odds ratios. For full set of parameter estimates (in log-odds) see Online Supplementary Appendix Tables S5 and S6.

* significant at 5%

Source: Authors' own calculations.

Table 5. The association between academic achievement, students' self-efficacy and parental dissatisfaction with schools/teachers (odds ratios). Research question 4.

(a) Satisfaction with schools

Variables	M1	M2	M3
Academic achievement grade 6	0.85*	0.87*	0.89*
Self-confidence grade 6	0.85*	0.85*	0.86*
Controls			
Gender	Y	Y	Y
Socio-economic status	Y	Y	Y
Immigrant status	Y	Y	Y
Questionnaire respondent	Y	Y	Y
Grade 3 reading and maths scores	-	Y	Y
Parental satisfaction grade 3	-	-	Y
Location at grade 3	Y	Y	Y
School fixed effects	Y	Y	Y
Observations	9,918	9,918	9,918

(b) Satisfaction with teachers

Variables	M1	M2	M3
Academic achievement grade 6	0.86*	0.92*	0.93*
Self-confidence grade 6	0.93*	0.95	0.95
Controls			
Gender	Y	Y	Y
Socio-economic status	Y	Y	Y
Immigrant status	Y	Y	Y
Questionnaire respondent	Y	Y	Y
Parental satisfaction grade 3	-	Y	Y
Grade 3 reading and maths scores	-	-	Y
Location at grade 3	Y	Y	Y
School fixed effects	Y	Y	Y
Observations	9,918	9,918	9,918

Dependent variable: Low parental satisfaction with the school (grade 6) takes the value "1" for the bottom quintile of the scale and "0" otherwise.

Method of estimation: Maximum Likelihood. Logit regression model. Weights have been applied. Figures refer to odds ratios. For full set of parameter estimates (in log-odds) see Online Supplementary Appendix Tables S7 and S8.

* significant at 5%

Source: Authors' own calculations.

Table 6. The association between feedback about children’s progress and parental dissatisfaction with schools/teachers (odds ratios). Research question 5.

(a) Satisfaction with schools

Variables	M1	M2	M3	M4
Feedback about child's progress	0.90*	0.90*	0.89*	0.88*
Controls				
Gender	Y	Y	Y	Y
Socio-economic status	Y	Y	Y	Y
Immigrant status	Y	Y	Y	Y
Questionnaire respondent	Y	Y	Y	Y
Satisfaction grade 3	-	Y	Y	Y
Feedback received in grade 3	-	-	Y	Y
Grade 6 reading and maths scores	-	-	-	Y
Location at grade 3	Y	Y	Y	Y
School fixed effects	Y	Y	Y	Y
Observations	9,918	9,918	9,918	9,918

(b) Satisfaction with teachers

Variables	M1	M2	M3	M4
Feedback about child's progress	0.89*	0.89*	0.89*	0.88*
Controls				
Gender	Y	Y	Y	Y
Socio-economic status	Y	Y	Y	Y
Immigrant status	Y	Y	Y	Y
Questionnaire respondent	Y	Y	Y	Y
Feedback received in grade 3	-	Y	Y	Y
Satisfaction grade 3	-	-	Y	Y
Grade 6 reading and maths scores	-	-	-	Y
Location at grade 3	Y	Y	Y	Y
School fixed effects	Y	Y	Y	Y
Observations	9,918	9,918	9,918	9,918

Dependent variable: Low parental satisfaction with the school (grade 6) takes the value “1” for the bottom quintile of the scale and “0” otherwise.

Method of estimation: Maximum Likelihood. Logit regression model.

Weights have been applied. Figures refer to odds ratios. For full set of parameter estimates (in log-odds) see Online Supplementary Appendix Tables S9 and S10.

* significant at 5%

Source: Authors’ own calculations.