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## Getting the Teacher's Attention: Parent-Teacher Contact and Teachers' Behavior in the Classroom

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## Abstract

Studies suggest that support from teachers in the classroom can matter for student success. Although cross-national research has revealed numerous ways in which parents shape the schooling process, little is known about how parental involvement at school may or may not influence the amount of support students receive from teachers in the classroom. In this study, I draw on data from the China Education Panel Survey – a nationally representative survey of Chinese middle school students with unusually detailed information on parental involvement and teachers' behavior in the classroom – to test a conceptual model that proposes a link between parent-teacher contact in China and the attention students receive from teachers. In support of the conceptual model, I find that students whose parents cultivate relationships with teachers through frequent contact are more likely to be called on or praised by teachers, even after controlling for family background, student academic performance, and student behavior. Moreover, I find evidence of social class differences in parent-teacher contact in China, as well as evidence that parent-teacher contact shapes later academic performance through its impact on teachers' attention. Overall, findings from the study point to a new way in which social class influences schooling through the mechanism of parental involvement. I conclude with a discussion of recent changes in public education in the United States that may lead this pathway to be increasingly important in the U.S. as well.

## Keywords

student success, China Education Panel Survey, social class, academic performance, parent-teacher interactions, schooling inequality

## Disciplines

Demography, Population, and Ecology | Educational Sociology | Family, Life Course, and Society | Inequality and Stratification | Social and Behavioral Sciences | Sociology

## Comments

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## **Getting the Teacher's Attention: Parent-Teacher Contact and Teachers' Behavior in the Classroom**

**Abstract:** Studies suggest that support from teachers in the classroom can matter for student success. Although cross-national research has revealed numerous ways in which parents shape the schooling process, little is known about how parental involvement at school may or may not influence the amount of support students receive from teachers in the classroom. In this study, I draw on data from the China Education Panel Survey – a nationally representative survey of Chinese middle school students with unusually detailed information on parental involvement and teachers' behavior in the classroom – to test a conceptual model that proposes a link between parent-teacher contact in China and the attention students receive from teachers. In support of the conceptual model, I find that students whose parents cultivate relationships with teachers through frequent contact are more likely to be called on or praised by teachers, even after controlling for family background, student academic performance, and student behavior. Moreover, I find evidence of social class differences in parent-teacher contact in China, as well as evidence that parent-teacher contact shapes later academic performance through its impact on teachers' attention. Overall, findings from the study point to a new way in which social class influences schooling through the mechanism of parental involvement. I conclude with a discussion of recent changes in public education in the United States that may lead this pathway to be increasingly important in the U.S. as well.

### **1. Introduction**

Parental involvement is believed to be crucial for children's success at school. Policy-makers in the United States, for example, have invested heavily in programs to increase levels of parental involvement, particularly in low-income communities (Domina 2005). In China, home to the largest educational system in the world (OECD 2016), recent educational reforms have sought to increase collaboration between parents and teachers as a means of improving student performance (Kong 2016). The idea that parental involvement matters is also echoed within the

academic literature. Key sociological theories conceptualize parental involvement as an important mechanism through which social class influences student outcomes at school. According to this argument, parents with high socioeconomic status are more actively and/or effectively involved in their children's schooling than parents with low socioeconomic status, and this helps explain why their children have lower drop-out rates, higher academic performance, and higher educational attainment, on average, than other children (Baker and Stevenson 1986; Entwisle et al. 1986; Coleman 1987; Lareau 2000, 2011; Epstein 1992; C. Muller 1993; Ho and Willms 1996; Desimone 1999; Domina 2005).

But how does parental involvement work to shape student success? Scholars in the sociology of education field have proposed several mechanisms through which the parental involvement practices of families with high socioeconomic status influence student experiences and trajectories at school. First, parents with high socioeconomic status keep their children on track by monitoring and checking homework and communicating with their children about coursework, teachers, and academic or non-academic issues encountered at school (Baker and Stevenson 1986; Eccles and Harold 1993; Ho and Willms 1996; McNeal 1999; Park 2008; Park, Byun, and Kim 2011). Second, high SES parents seek out information to help their children progress through school, such as asking teachers about their child's performance or speaking with school administrators or other parents about school programs, expectations, and requirements. Parents draw on this information to tailor the academic support they provide at home and to strategize and make informed decisions about their child's education, such as how many advanced-level courses to take (Baker and Stevenson 1986; Eccles and Harold 1993; Ho and Willms 1996; Lareau 2000; Park, Byun, and Kim 2011). Socioeconomically advantaged parents may also collect information about and enroll their children in academic tutoring programs, so as to improve course grades or performance on high-stakes exams (Park, Byun, and Kim 2011). Finally, high SES parents are more likely than other parents to intervene when their child faces an obstacle at school, such as a poor exam score, grade retention, or being overlooked for the Gifted and Talented Program or advanced academic tracking (Baker and Stevenson 1986; Useem 1992; Hallinan 1994; Oakes 1994; Lareau 2000). In these cases, parents may contact a school administrator or teacher to obtain a second chance on an exam or access to a desired academic program or track.

Largely overlooked by sociological theories about how parental involvement matters for schooling, however, is the role parents may play in shaping teachers' behavior toward students in the classroom. Although scholars have examined how meetings and discussions with parents can influence teachers' perceptions of a child's academic performance (Hill and Craft 2003), less clear is whether parent-teacher contact can modify how teachers act toward one's child on a daily basis. In this paper, I present evidence that this mechanism is at play in at least one context: post-reform China. I argue that features of the contemporary Chinese context, including large class sizes, the rising importance of the cultural practice of *guanxi*, and the emergence of a new affluent class deeply concerned with transmitting newly acquired advantages to the next generation, have contributed to the development of a new pathway through which parents can influence their children's progress at school: namely, by contacting teachers to secure extra attention and academic support for one's child in the classroom. I then draw on data from a nationally representative, longitudinal survey of 10,279 middle school students and their families in China to assess the empirical evidence for this parental involvement pathway. Given that China's educational system is the largest in the world – educating nearly 260 million students and employing more than 15 million teachers (OECD 2016) – if there is empirical evidence that contact with teachers shapes

teachers' behavior toward students in China, and that this has implications for later academic performance, it would be a great oversight to exclude this mechanism from theories about how parental involvement influences student outcomes. Moreover, this mechanism may be at play in other societies, particularly in contexts in which attention from teachers in the classroom is a scarce, valuable resource.

## 2. Conceptual Model

The current study proposes a new pathway through which parental involvement shapes schooling. According to the conceptual model (Figure 1), parent-teacher contact, which is stratified by social class, influences later academic performance through its impact on teachers' behavior. The key relationships proposed by the conceptual model are as follows: 1) socioeconomically advantaged families are more likely to contact teachers, and at higher rates, than working class families (Path A in Figure 1); 2) contact with teachers is associated with the amount of attention<sup>1</sup> students receive in the classroom, as teachers are expected to exhibit preferential behavior toward children of parents with whom they are in frequent contact (Path B in Figure 1); and 3) students who receive more attention in the classroom experience greater improvement in academic performance over time, relative to other students (Path C in Figure 1).

[Figure 1 about here]

Research in other contexts provides strong evidence of a relationship between social class and parent-teacher contact (Path A). For example, studies conducted in the United States indicate that native-born middle-class parents frequently cultivate linkages between home and school through communication with teachers and school administrators, while working class and poor parents feel less comfortable contacting teachers and administrators and otherwise intervening at school (Baker and Stevenson 1986; Useem 1992; Eccles and Harold 1993; Hallinan 1994; Ho and Willms 1996; Hill and Craft 2003; Lareau 2000, 2011). It is unclear, however, whether the association between social class and parent-teacher contact observed within Western societies is also present within East Asia, since East Asian parents are thought to intervene in their children's schools less than other parents. Some scholars have suggested that structural features of East Asian educational systems limit the utility of parent-school communication, leading other forms of involvement to play a larger role in schooling (Stevenson et al. 1990; Park, Byun, and Kim 2011). Moreover, scholars have argued that East Asian cultural beliefs lead parents to draw boundaries between the home and school domains and demonstrate deference to teachers and school administrators (Stevenson and Stigler 1994; Ho and Willms 1996; Goyette and Conchas 2002; Chan 2004; Sy, Rowley, and Schulenberg 2007; Tobin, Hsueh, and Karasawa 2009; Kong 2016). That is, attempting to influence the school domain through contact with teachers is thought to go against East Asian cultural norms. If parent-school communication is not common in East Asia, we may not see much difference between socioeconomically advantaged and working class families in the frequency with which they contact teachers. As such, despite the body of evidence available in Western countries, it is worth investigating whether social class is associated with parent-teacher contact in China.

In support of the proposed relationship between teachers' attention and later academic performance in the conceptual model (Path C), researchers in the U.S. have found that the behavior teachers exhibit toward students has implications for student outcomes. For example, scholars have documented a relationship between the support students receive from teachers and academic

performance and drop out (Klem and Connell 2004; Hamre and Pianta 2005). In particular, there is strong evidence that students in the U.S. who have good relationships with their teachers benefit from increased engagement in learning and better social adjustment at school (Osterman 2000; Furrer and Skinner 2003; Hughes and Kwok 2007), all of which can influence educational expectations, achievement, and the decision to drop out of school (Wigfield and Eccles 2000; Domina 2005; Hughes and Kwok 2007). While research in the U.S. provides a strong basis for expecting a relationship between teachers' attention and later academic performance in other contexts, to my knowledge no prior study has documented this relationship in China and, as such, it is worth testing empirically.

In summary, scholars conducting research in the U.S. and other Western contexts have found evidence in support of two of the key relationships within the proposed conceptual model: between social class and parent-teacher contact (Path A) and between teachers' attention and later academic performance (Path C). Nevertheless, it is worth investigating whether these relationships hold in contemporary China, particularly given differences between the U.S. and China in cultural context and educational policies and structures. In contrast to Path A and Path C, to my knowledge no previous research exists on the implications of parent-teacher contact for teachers' attention (Path B), nor have scholars linked Path A to Path C through this mechanism. That is, no previous studies have suggested that social class differences in parent-teacher contact shape inequalities in student outcomes as a result of an association between parent-teacher contact and teachers' attention. In the section that follows, I discuss features of the Chinese context that lead me to hypothesize that teachers' attention connects these two mechanisms by acting as a mediator in the relationship between parent-teacher contact and later academic performance.

### 3. The Chinese Context

Following the establishment of the People's Republic of China, disparities in income and educational opportunity narrowed relative to pre-1949 levels, leading to the perception of China as an increasingly egalitarian society (Deng and Treiman 1997). With the re-introduction of market forces into the Chinese economy beginning in the late 1970s, however, new opportunities emerged for Chinese households to increase their stores of economic capital through entrepreneurship, financial investment, and high-paid employment. Consequently, in recent decades China has witnessed rising inequality and the emergence of a new affluent class (Y. Xie and Zhou 2014; Author DATE).

Members of the new affluent class in China are faced with a unique situation: they seek to transmit their newly acquired advantages to their children, yet they do so in the face of relatively few established structures for reproducing social class. As in other countries, the education field has become an important site of struggle for those hoping to secure a place at the top of the new social hierarchy, given the close link between educational attainment and occupational attainment/income. Scholars are just beginning to document the new strategies China's emerging affluent class is developing to help their children succeed at school (Lin 2006; Wu 2014; A. Xie 2016; Author DATE). Within this small but growing body of literature, there has been some attention to parents' adaptation of the cultural practice of *guanxi* to family-school relationships and implications for educational inequality.

The term *guanxi* refers to a type of dyadic, interpersonal relationship in China that is cultivated for instrumental purposes and maintained through mutual exchange of favors (Gold

1985; Bian 2006). Scholars have argued that the cultural practice of *guanxi* emerged in the context of competition for scarce resources in China and bureaucratic structures for resource distribution (Gold 1985; Bian 1997). To obtain scarce resources, social actors cultivate ties with individuals who have access to these resources, with the understanding that the individual providing the scarce resource will receive a favor in return (Gold 1985; Riley 1994). Notably, individuals who fail to reciprocate a favor risk “losing face” (*diu mianzi*), a dishonor that has implications not only for one’s social status and perceived moral character, but also for one’s ability to obtain scarce resources through *guanxi* in the future (Bian 1997).

Studies have documented the increasingly important role of *guanxi* in obtaining access to scarce resources in post-reform China (Bian and Zhang 2014), including high-quality housing (Logan, Bian, and Bian 1999) and top-paying or prestigious jobs (Bian 1997). There has also been growing attention to how *guanxi* may assist in the education field. In particular, the use of *guanxi* to secure access to top-ranked schools has been heavily covered in the Chinese media and is beginning to attract scholarly attention (Wu 2014; A. Xie 2016). In addition to *guanxi* assisting in school admissions, there is evidence that some Chinese parents are cultivating *guanxi* with teachers. A recent qualitative study conducted in a rural county in southern China, for example, revealed that many socioeconomically advantaged families gave gifts to teachers or invited them to banquets with government officials before speaking with them about their child’s studies (A. Xie 2016). By first providing a favor, these parents felt entitled to later ask teachers to help their child. In contrast, many of the lower income families interviewed expressed hesitancy to contact teachers because they feared they would be unable to provide suitable favors. Overall, this suggests that Chinese parents may be applying the cultural practice of *guanxi* to their interactions with teachers in an attempt to intervene at school.

Like other East Asian educational systems, features of the Chinese educational system block many of the pathways through which parent-school communication shapes schooling in other societies. For example, teacher recommendations and grades in the classroom – both of which can be influenced by parent-teacher contact – do not, as a rule, factor into applications to senior high school or university (Hill and Craft 2003), which is primarily determined by performance on entrance examinations. Moreover, academic tracking within-schools is less common in China and students are given relatively few opportunities to “customize” their educational experience by choosing elective courses, at least at the compulsory level of education. This feature of the educational system again reduces the extent to which parents can shape children’s progress in school through parent-school communication (Park, Byun, and Kim 2011). Overall, this leads one to ask, why are some Chinese parents cultivating *guanxi* with teachers? In what way do they expect this to benefit their child? Xie’s study of parent-school connections in rural China offers one potential answer to this question: many of the parents he interviewed identified “teacher’s care” (*guanzhao*) – or additional attention and assistance for children in the classroom – as an expected benefit of developing *guanxi* with teachers (A. Xie 2016).

Parental requests for “teacher’s care” make sense in the context of large, or even rising, class sizes (Brandt and Rawski 2008; Liu et al. 2010) in China. According to OECD estimates, the average class size in China is higher than in any other G20 country for which data are available. In 2014, there were an average of 48.8 students per class in Chinese middle schools, compared to 26.7 students in the average middle school classroom in the U.S. (“Student-Teacher Ratio and Average Class Size” 2017). While teachers in other countries may be able to provide individualized support

to most students, this is extremely difficult when teachers are responsible for almost fifty students at a time. In this context, attention from teachers in the classroom is a scarce resource (Parcel and Dufur 2001). This situation creates competition among students, where losers risk being overlooked by the teacher during daily lessons. As already discussed, research in the U.S. suggests that teacher support matters for student motivation and engagement, which can influence academic performance (Osterman 2000; Wigfield and Eccles 2000; Furrer and Skinner 2003; Klem and Connell 2004; Hamre and Pianta 2005; Domina 2005; Hughes and Kwok 2007). Any sort of academic boost may be critical in the context of extreme competition for education credentials in contemporary China (Zhao, Haste, and Selman 2014; Dong 2015).

By contacting teachers, Chinese parents may be in a position to request individualized support for their child (*guanzhao*). Moreover, the social norms governing the practice of *guanxi* likely put pressure on teachers to comply with parents' requests for extra attention, particularly if parents have already provided the teacher with a favor. As discussed, failing to reciprocate a favor can result in "losing face", which has implications for one's reputation and social relationships. Even in cases where parents request extra attention for their child without providing a favor, if the teacher would benefit from a social relationship with the family, or if he already has a relationship with the family, he may feel pressure to fulfill the family's request.

It is worth noting that parent-teacher contact may shape the amount of attention students receive from teachers even in the absence of a request from parents. Children may appear less anonymous in the classroom if their parents have been in contact with the teacher; since they "stand out" relative to other students, they may receive more attention. In addition, parent-teacher contact promotes social closure between home and school (Domina 2005), which can influence teachers' calculations regarding how to best invest their limited time and attention. Research suggests that teachers are more likely to invest in students whose academic performance is believed to be under their control (Babad 1993). Teachers may feel more "in control" of a student's performance if the student's family has expressed a commitment to helping their child succeed; by initiating contact with teachers, parents can signal this commitment (Hill and Craft 2003). In support of this idea, many of the teachers Xie interviewed in rural China said they felt motivated to provide extra attention to children whose parents had contacted them (A. Xie 2016).

Overall, features of the Chinese context, as well as qualitative research in China, lead me to expect that parent-teacher contact is shaping student outcomes in post-reform China through its impact on the amount of attention students receive from teachers in the classroom. In the remainder of the paper, I draw on two waves of data from a nationally representative survey of middle school students and families in China to assess the empirical evidence for this mechanism, as well as for other relationships proposed within the conceptual model (Figure 1).

## **4. Methods**

### Data

In this study, I draw on two waves of the China Education Panel Survey (CEPS), the first nationally representative, longitudinal survey of middle school students in Mainland China. The CEPS research team used multi-stage sampling with probabilities proportionate to size to select the baseline sample of Chinese seventh grade students in 2013-2014. Thirty-one provinces,



autonomous regions, and/or municipalities were included in the sampling frame (Taiwan, Hong Kong, and Macao were excluded). The CEPS dataset consists of 10,279 seventh grade students nested within 438 classrooms in 112 schools located across 28 counties/districts in Mainland China. Students completed a questionnaire and one parent of each sampled student completed a separate questionnaire. Four teachers of each sampled class completed questionnaires, as well as a school administrator. In the following academic year (2014-2015), the research team followed up with 9,449 of the sampled students (92%) and their teachers, school administrators, and parents.

Several features of the CEPS make it unusually well suited for this study. First, the data are nationally representative. As such, if the conceptual model is supported by these data, we can be more confident of the widespread nature of this parental involvement mechanism than if the data were drawn from a single city or region. Second, the CEPS contains more detailed information about parent-teacher contact than many other large-scale surveys. Many surveys fail to distinguish between different forms and directions of parent-school communication, such as parents contacting teachers, teachers contacting parents, parents contacting school administrators, and administrators contacting parents, despite the fact that the implications of these different forms of contact likely differ (Kohl, Lengua, and McMahon 2000). The CEPS parent questionnaire, in contrast, asks parents about contact with teachers, specifically, and has separate questions for parent-initiated contact and teacher-initiated contact. Moreover, while most surveys that collect data on teachers' behavior ask students to describe behavior toward the entire class, the CEPS asks students to report how teachers behaved toward them (i.e. the student completing the survey) in particular. This makes the dataset unusually well suited for investigating the hypothesized relationship between parent-teacher contact and teachers' attention. Finally, the longitudinal design of the survey allows for several attractive features: one can establish temporal precedence when assessing relationships that might be bi-directional; one can control for prior levels of variables; and one can assess within-student change in variables, in addition to between-student change.

## Measures

### *A. Social Class*

There is little consensus among sociologists regarding how to best measure social class. Some advocate for occupational prestige scales (Goldthorpe and Hope 1974; Treiman 1977; Nakao and Treas 1994); some focus on socioeconomic resources, such as education and income (Ganzeboom, De Graaf, and Treiman 1992); and others draw on "big class" schema (Erikson, Goldthorpe, and Portocarero 1979; Erikson and Goldthorpe 1992), sorting individuals into occupational categories with similar lifestyles, attitudes, and life chances (Jonsson et al. 2011). In this paper, I draw on both the "big class" and the "socioeconomic resource" approaches to measure social class. First, I use information about parents' occupations to sort families into occupational groups. The occupations that scholars generally conceptualize as part of China's working class (Lu 2002; Li 2005; Wu 2014) are combined into one group,<sup>2</sup> which is then compared to four high status and/or highly compensated occupations expected to differ from each other in lifestyles, attitudes, and resources: professionals; government workers; corporate managers; and small business owners (Bian et al. 2004; Lin 2006; Goodman 2008; A. Xie 2016). I define parental occupation as the occupation in which both parents are employed. If parents have different occupations, father's occupation is used.<sup>3</sup>

I use a socioeconomic resource, parental education, as a second measure of social class. Parental education is measured by mother's education, defined as 1=no more than elementary school education; 2=some secondary education; 3= completed academic high school; 4=some tertiary education. I use mother's education rather than a composite measure of mother and father's education because mothers are generally more involved in children's schooling than fathers (Grolnick and Slowiaczek 1994), particularly in East Asia (Stevenson et al. 1990). Moreover, Marks (2008) found mother's education to be either as strong or a stronger predictor of children's outcomes than father's education across various countries.

### *B. Parent-Initiated Contact with Teachers*

The measure of parent-initiated contact with teachers that I use is based on parents' responses to the following question: "this semester, did you initiate contact with your child's school teachers? 1) Never; 2) Once; 3) 2-4 times; 4) 5 or more times." For simplicity, I sometimes refer to this variable as "parent-teacher contact." I am particularly interested in who falls into the highest category of parent-teacher contact, as this may indicate an intention, on the part of parents, to cultivate relationships/*guanxi* with their child's teachers. Consequently, in addition to the four-category variable, I construct another variable coded 1 if the parent reports contacting teachers 5+ times per semester and 0 if the parent reports lower frequencies of contact with teachers. I use this binary outcome variable when testing for social class differences in cultivating relationships with teachers. In all other models I use the original four-category dummy variable.

### *C. Attention from Teachers in the Classroom*

In the survey, students were asked, "with regard to your main classes, do you agree (on a 4-point Likert scale) with the following statements?" Among these statements, students were asked whether: 1) "my math teacher often 'cold calls' on me (*tiwen wo*)"; 2) "my language arts teacher often 'cold calls' on me"; 3) "my English teacher often 'cold calls' on me"; 4) "my math teacher often praises me"; 5) "my language arts teacher often praises me"; and 6) "my English teacher often praises me." Later, students were asked whether they agreed (on a 4-point Likert scale) with the statement "my homeroom teacher often praises me." I generate a new variable, which I call "teachers' attention", that is equal to the sum of each student's responses to the seven questions about being cold called on or praised by teachers. The "teachers' attention" scale ranges from 7 to 28 and has a Cronbach's alpha of 0.89, which suggests a high level of internal consistency.<sup>5</sup>

### *D. Academic Performance*

The measure of academic performance used in analysis is based on school reports of student performance on midterm examinations. Schools were asked to report each student's performance on math, English, and language arts midterms in the semester in which the survey was conducted. The final measure of academic performance is equal to the student's overall average on the three midterm exams.

### *E. Control Variables*

I include the following control variables in all models: gender, migrant status, ethnic minority status, household registration type (*hukou*), family structure (1=both parents live at home;

0=at least one parent is absent), and whether or not the child has siblings. When testing for a relationship between parent-teacher contact and social class, I also control for academic performance, as well as for a number of school-level variables. I include school-level controls since particular schools may provide more opportunities for parents to communicate with teachers and school administrators and/or participate in school activities. If these schools are more likely to enroll children from socioeconomically advantaged families, this could produce a spurious relationship between parent-teacher contact and social class. School-level control variables include school type (1=private; 0=public), school rank (ranging from 1-5), the county in which the school is located, whether the school is located in an urban area, and whether students board at the school (0=none board; 1=all board; 2=some board).<sup>6</sup>

When testing for a relationship between parent-teacher contact and teachers' attention, I also include controls for student behavior. Student behavior may influence the amount of attention the student receives from teachers. If there is also an association between student behavior and frequency of parent-initiated contact with teachers, this could produce a spurious relationship between parent-teacher contact and teachers' attention. I include the following variables associated with student behavior as controls: academic performance, psycho-social problems, self-assessment of one's academic performance relative to classmates, and motivation and engagement at school (measured via four scales identified through factor analysis).

### Analytic Strategy

To examine the first pathway proposed by the conceptual model (Path A, Figure 1), I test whether socioeconomically advantaged families are more likely to cultivate relationships with teachers than other families. I employ multilevel mixed effects logistic regression, regressing contacting teachers 5 or more times per semester on social class and a set of control variables. Multilevel modeling is preferred over single-level modeling due to the clustered nature of the CEPS dataset.<sup>7</sup>

Next, I examine the second pathway proposed by the conceptual model (Path B in Figure 1): namely, that parent-teacher contact is associated with teachers' attention. I estimate a series of multilevel mixed effects linear regression models in which students' scores on the teachers' attention scale are regressed on frequency of parent-initiated contact with teachers and a set of controls. I then estimate a fixed effects linear regression model of teachers' attention on parent-teacher contact. By investigating whether within-student change in parent-initiated contact with teachers is associated with within-student change in attention from teachers in the classroom, I effectively control for all unobserved time-invariant variables (Allison 2009).

Finally, I employ structural equation modeling to engage in analysis of the mediation mechanism proposed in the conceptual model: namely, that parent-teacher contact influences later academic performance indirectly, through its effect on teachers' attention. I simultaneously estimate two equations: one for the effect of parent-teacher contact on teachers' attention (Path B) and one for the effect of teachers' attention on academic performance (Path C). To establish temporal precedence in the second equation, I regress current academic performance on teachers' attention reported in the previous year. Moreover, I add a control for prior academic performance, so that I am effectively estimating the association between teachers' attention and *change* in academic performance.<sup>8</sup> By including the first equation in the structural equation model (Path B), I

am able to assess the evidence for an indirect effect of parent-teacher contact on later academic performance through its effect on teachers' attention.<sup>9</sup>

## 5. Results

### Social Class and Parent-Teacher Contact

Do the data provide evidence in support of the first relationship proposed in the conceptual model, between social class and parent-teacher contact (Path A)? I am particularly interested in whether socioeconomically advantaged families are more likely to cultivate relationships with teachers, which I operationalize as falling into the highest category of parent-initiated contact with teachers.<sup>10</sup> Table 2 reports results from the full set of multilevel mixed effects logistic regression models of contacting teachers 5 or more times per semester. In the baseline model, parent-teacher contact is regressed on a set of control variables. In Model 2, I add dummy variables for the first measure of social class to the model. In line with the conceptual model, certain socioeconomically advantaged occupational groups appear more likely to cultivate relationships with teachers than working class parents. Relative to working-class parents, the odds of contacting teachers 5 or more times are 1.57 times higher for government workers ( $p < 0.05$ ) and 1.87 times higher for professionals ( $p < 0.001$ ). Corporate managers and small business owners, on the other hand, do not significantly differ from working class families on this measure of parent-teacher contact.<sup>11</sup> In Model 3, I remove parental occupation from Model 2 and instead investigate the relationship between parent-teacher contact and the second measure of social class, parental education. Again, I find evidence of a relationship between social class and parent-teacher contact: the odds of contacting teachers 5+ times per semester are 1.58 times higher for mothers with an academic high school diploma ( $p < 0.001$ ) and 2.43 times higher for mothers with tertiary education ( $p < 0.001$ ), relative to mothers with no more than middle school or vocational high school education.

[Table 2 about here]

### Parent-Teacher Contact and Teachers' Behavior

Do the data provide evidence in support of the path linking parent-teacher contact to teachers' behavior (Path B)? To test this I estimate a series of multilevel mixed effects linear regression models in which student scores on the teachers' attention scale are regressed on parent-teacher contact (Table 3). In the baseline model, I find evidence that attention from teachers in the classroom is associated with a number of individual-level and school-level variables. For example, private school students report higher levels of attention from teachers, on average, than public school students ( $p < 0.001$ ). Moreover, the level of personal attention a student receives from teachers is positively associated with student academic performance ( $p < 0.001$ ). Later, I will draw on two waves of data to investigate this relationship further. Finally, there is some evidence of a positive relationship between social class and teachers' attention, whether social class is measured by parental occupation or education.

[Table 3 about here]

In Model 2, I add the key independent variable – frequency of parent-initiated contact with teachers – to the model. Overall, in line with the conceptual model, higher frequencies of contacting

teachers are associated with higher scores on the teachers' attention scale. On average, relative to students whose parents contacted teachers 2-4 times per semester (the most common response category, representing about 36 percent of parents), students whose parents never contacted teachers in a given semester scored almost one point lower on the teachers' attention scale ( $p < 0.001$ ), students whose parents contacted teachers once scored a little less than half a point lower on the teachers' attention scale ( $p < 0.001$ ), and students whose parents contacted teachers 5+ times scored 0.6 points higher on the teachers' attention scale ( $p < 0.001$ ).

Although Model 2 includes a control for the school's evaluation of the student's academic performance, it is possible that other aspects of student behavior produce a spurious relationship between parent-teacher contact and teachers' attention. Consequently, in Model 3 I add controls for additional variables related to student behavior. Although the coefficients on parent-teacher contact decline in magnitude after adding these controls, they remain statistically significant. Next, to ensure that parents are not merely reacting to teachers' behavior, which could lead to a spurious relationship between teachers' attention and parent-teacher contact, I add a control for teacher-initiated contact with parents in Model 4. Even after adding this control, which arguably produces quite conservative estimates,<sup>12</sup> I observe that students whose parents never contacted teachers or only contacted teachers once receive less attention from teachers, on average, than students whose parents contacted teachers 2-4 times.<sup>13</sup>

Finally, I estimate a fixed effects linear regression model of teachers' attention on parent-teacher contact. This approach allows me to control for all unobserved time-invariant variables. Essentially, I am restricting analysis to within-student change in parent-teacher contact and testing whether this is associated with within-student change in teachers' attention. As shown in Table 4, even with this very conservative approach (conservative in that we are ignoring between-student variation), I find evidence of a relationship between parent-teacher contact and teachers' attention. On average, students whose parents decrease contact with teachers from 2-4 times per semester to never between survey years experience a 0.42 point decrease in their score on the teachers' attention scale ( $p < 0.05$ ), while students whose parents decrease contact with teachers from 2-4 times to once per semester experience a 0.47 point decrease in their score on the teachers' attention scale ( $p < 0.01$ ).<sup>14</sup> A post-estimation test leads me to reject the null hypothesis that there is no relationship between within-student change in parent-teacher contact and within-student change in teachers' attention. Overall, this provides strong evidence in support of an association between parent-teacher contact and the amount of attention students receive in the classroom.

[Table 4 about here]

### Parent-Teacher Contact and Later Academic Performance

I have found strong evidence for an association between social class and parent-teacher contact and between parent-teacher contact and teachers' attention. In this last section, I test the mediation mechanism proposed in the conceptual model: namely, that parent-teacher contact shapes later academic performance through its impact on teachers' attention. To engage in mediation analysis, I employ structural equation modeling, simultaneously estimating two equations: one equation for the effect<sup>15</sup> of the key explanatory variable (parent-teacher contact) on the mediating variable (teachers' attention); and one equation for the effect of the mediating variable (teachers' attention) on the key outcome variable (later academic performance).

For the first equation, teachers' attention in grade seven is regressed on parent-teacher contact in grade seven, with controls for academic performance in grade seven and a set of time-invariant individual and school-level variables. In fact, this model is very similar to the model estimated earlier to test for a relationship between parent-teacher contact and teachers' attention (Table 3). In this version of the model, however, analysis is restricted to data collected in the survey's first wave. Consequently, only between-student differences in teachers' attention and parent-teacher contact are used to estimate the coefficient on parent-teacher contact.<sup>16</sup>

In the second equation, which is simultaneously estimated alongside the first equation, academic performance in grade eight is regressed on teachers' attention in grade seven, with controls for the same individual and school-level variables in the first equation, including academic performance in grade seven. By controlling for academic performance in grade seven, I am effectively testing whether *change* in academic performance is associated with the covariates. Moreover, including teachers' attention in grade seven in the model rather than teachers' attention in grade eight helps establish temporal precedence. The coefficient on teachers' attention can be interpreted as the change in academic performance between grades seven and eight associated with a one-unit increase in a student's score on the teachers' attention scale in grade seven, controlling for various individual-level and school-level variables.

In line with the results presented in Table 3, I find evidence of a direct effect of parent-teacher contact on teachers' attention ( $p < 0.01$ ) (Figure 2). In addition, I find strong evidence that teachers' attention has a positive, direct effect on later academic performance. Specifically, a one standard deviation increase in a student's score on the teachers' attention scale in seventh grade is associated with a 0.04 standard deviation improvement on eighth grade midterm exams, relative to performance on seventh grade midterm exams ( $p < 0.001$ ). Although this estimated "effect" is small in magnitude, it may accumulate over several years of school, eventually producing an extra boost for students on high-stakes entrance examinations for high school and university, in which small distinctions in performance matter. Finally, post-estimation analysis provides evidence for an indirect effect of parent-teacher contact on later academic performance through its impact on teachers' attention ( $p < 0.01$ ). In other words, I find support for the idea that higher levels of parent-initiated contact with teachers lead to a boost in students' later academic performance because teachers redirect more attention to the children of parents with whom they are in more frequent contact.

[Figure 2 about here]

A limitation of these results is that they are based on a number of assumptions. Specifically, in order to estimate a structural equation model, one must make assumptions about causality that are then built into, rather than tested by, the model. The model presented is based on the assumption that parent-initiated contact with teachers affects teachers' attention and teachers' attention affects academic performance. A model that reverses the direction of causality, such that academic performance affects teachers' attention (equation 1), which in turn affects parent-initiated contact with teachers (equation 2), fits the data equally as well.<sup>17</sup> I argue, however, that the previous literature provides more support for the direction of causality I have proposed than the direction of causality proposed by this alternative model. In particular, although a sizeable body of research has shown that parents may modify contact with teachers in response to their child's academic performance (Crosnoe 2001; McNeal 1999; Chandra Muller 1998; Ho and Willms 1996; Downey 2002), most of these studies find a *direct* link between student academic performance and

parent-teacher contact, not an indirect link mediated by teachers' attention. Moreover, these previous studies suggest that parents increase contact with teachers when their children struggle academically, while the alternative model proposes that parents *decrease* contact with teachers when their children are struggling. Finally, interviews with parents and teachers in China provide support for the direction of causality proposed by the conceptual model; that is, that teachers modify their behavior in response to parents contacting them.

## 6. Conclusion

Current sociological theories about how parental involvement shapes schooling recognize that parents can directly influence the decisions that schools make, such as whether or not one's child is placed in a Gifted and Talented program or sorted into an advanced academic track ((Baker and Stevenson 1986; Useem 1992; Hallinan 1994; Oakes 1994; Lareau 2000). Less understood is whether parents can influence teachers' behavior in the classroom. There has been some attention to the association between parent-school communication or parental involvement in school activities and teachers' evaluations of student academic performance (Hill and Craft 2003). Scholars have also argued that parents can influence teachers' behavior *indirectly*: parents shape how children interact with teachers, which can influence how much help teachers provide them in the classroom (Lareau 2011; Calarco 2011). Left largely unanswered by the previous literature, however, is how parents may *directly* influence the amount of support teachers provide students in the classroom. Given a sizeable body of research documenting various ways in which support from teachers matters for student outcomes, at least within the U.S., this is a notable gap.

Results from the current study provide some preliminary evidence that socioeconomically advantaged parents in China are influencing the amount of attention their children receive in the classroom through contact with teachers. First, I documented a positive, statistically significant association between social class and contacting teachers 5 or more times per semester. This association was observed whether I measured social class by parental occupation or by parental education. Second, I found evidence of a positive relationship between parent-teacher contact and the level of attention students received from teachers in the classroom. Finally, mediation analysis provided support for the idea that parent-teacher contact shapes later academic performance through its effect on teachers' attention. Altogether, these findings point to an overlooked mechanism through which social class may influence schooling, at least in China: high SES parents are more likely to contact teachers, and at higher rates, than other parents, leading their children to benefit from preferential treatment in the classroom.

A few limitations are worth mentioning. First, due to the CEPS data being observational, as is generally the case with survey data, one cannot conclude definitively that parents contacting teachers *causes* students to receive more attention in the classroom. Nevertheless, I did assess two competing explanations for the observed association: 1) *Reverse causality*: teachers contact the parents of students in which they are particularly invested in the classroom, which leads parents to contact that teacher more frequently; 2) *Spurious relationship*: unobserved individual-level characteristics influence both teachers' attention and levels of parent-initiated contact with teachers. To assess the first competing explanation, I added a control for teacher-initiated contact with parents. In response to the second competing explanation, I first added controls for student behavior in the classroom into the mixed effects models. Later, I estimated a fixed effects model in which analysis was restricted to within-student variation, thereby controlling for all unobserved

time-invariant individual-level characteristics. In all cases, the results were largely the same, thereby lending support to the causal relationship proposed by the conceptual model: that parent-teacher contact influences teachers' attention. Moreover, Xie's (2016) study in rural China provides qualitative evidence in support of this interpretation, and, as discussed earlier, there are other reasons to expect parent-teacher contact to affect teachers' attention.

The non-experimental nature of the data also poses limitations to assessing causality in the observed relationship between teachers' attention and student outcomes. However, by taking advantage of the study's longitudinal design to establish temporal precedence and control for prior academic performance, I was able to provide stronger evidence for a causal effect of teachers' attention on academic performance than would be possible with cross-sectional data. Finally, as previously discussed, the mediation model tested (i.e. the model proposing that parent-teacher contact shapes later academic performance through its impact on teachers' attention) is based on assumptions about causality. Although another model that makes different assumptions about the direction of causality fits the data equally as well, the previous literature and existing theory provide stronger support for the causal assumptions built into the model tested in this paper than for those associated with the alternative model.

Although the main contribution of this paper is to refine broad sociological theories about how parental involvement works by proposing a new mechanism through which parent-teacher contact shapes schooling in China, the findings also have implications for U.S. society. In recent years, budget cuts have led to rising class sizes in certain U.S. public school districts (Dillon 2011). Public middle schools in Clark County, Nevada, for example, averaged ~36 students per class in 2017, compared to a national average of ~26 ("The Systemic Problem of High Class Size" 2018). As suggested in this paper, in contexts in which attention from teachers in the classroom is a scarce resource, some parents may reach out to teachers to request extra help for their child. Of course, in the absence of the cultural practice of *guanxi*, making requests of teachers may not lead to the desired outcome. Nevertheless, there are other reasons to expect parent-teacher contact to have a positive impact on the amount of attention students receive in the classroom. Children may "stand out" if teachers know their parents, and, consequently, receive more attention. Moreover, the social closure created by parent-teacher contact may create incentives for teachers to invest more time in the children of parents with whom they are in contact. Even if larger class sizes do not lead parents to contact teachers more frequently, rising class sizes may strengthen the relationship between parent-teacher contact and teachers' attention, as teachers struggle to decide how to allocate their limited attention. Given the overwhelming evidence that parent-teacher contact is stratified by race and social class in the U.S., rising class sizes in U.S. public schools might be expected to exacerbate existing racial and socioeconomic inequalities in education, posing an additional challenge to U.S. policymakers concerned with educational inequality. Future studies should explore whether the mechanism proposed in the current study is at play in the U.S., particularly in the context of rising class sizes, and the implications this has for equality of educational opportunity.

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## Endnotes



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- <sup>1</sup> I use the term “attention” to refer to *positive* attention students receive in the classroom, such as being called on or praised by the teacher. Disciplinary actions and other negative forms of attention are not the focus of the current study.
- <sup>2</sup> The following occupations were combined to create the “working class” category: 1) skilled blue-collar workers; 2) production and manufacturing general staff; 3) commercial and service industry general staff; 4) farmers; 5) non-employed/unemployed.
- <sup>3</sup> There are three exceptions to this: 1) if father’s occupation is missing, parental occupation is defined by mother’s occupation; 2) if the mother is a professional, government worker, or corporate manager and the father is a small business owner or in a working class occupation, parental occupation is defined by mother’s occupation; 3) if the mother is a small business owner and the father is in a working class occupation, parental occupation is defined by mother’s occupation.
- <sup>4</sup> Although student reports of being called on by teachers may be influenced by student participation in the classroom, the CEPS survey question asks students about “cold calling”. A teacher engages in cold calling when he asks a student to answer a question that the student has *not* volunteered to answer. As such, cold calling is less influenced by student participation than are other measures of being called on by teachers.
- <sup>5</sup> I performed principal component factor analysis to assess the unidimensionality of the scale. Only the first factor had an eigenvalue above 1.0 and all seven scale items had loadings over 0.4 on the first factor, suggesting that the scale is unidimensional.
- <sup>6</sup> Models were also run with a control for a composite variable based on the school’s report of structural opportunities for parent-school communication (e.g. frequency of parent meetings; activities at the school open to parents). Although there was a strong bivariate relationship between this measure and frequency of parent-initiated contact with teachers, the relationship disappeared after controlling for other individual-level and school-level variables and is not included in the final models.
- <sup>7</sup> Multi-level modeling allows for correction for dependence among repeated observations on the same individual or among students nested within the same school. Without these adjustments, estimated standard errors would be biased downward, and parameter estimates may be statistically inefficient (Raudenbush and Bryk 2002; Luke 2004).
- <sup>8</sup> Including lagged dependent variables in multi-level mixed effects models can produce severe bias (Bhargava and Sargan 1983; Rabe-Hesketh and Skrondal 2012). Consequently, the models I

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estimate at this stage are single-level models. I account for dependence among observations by using robust standard errors that adjust for within-cluster correlation.

- <sup>9</sup> The proportion of missing data did not exceed 5.14% for any individual variable included in the models and results were robust to choice of method for handling missing data. For example, estimating models using the multiple imputation procedure did not substantially change any conclusions.
- <sup>10</sup> As a robustness check, I estimated a set of ordered logit models to test the association between frequency of parent-teacher contact and social class. As in the logit models presented in the paper, I found strong evidence of a relationship between social class and parent-teacher contact.
- <sup>11</sup> In addition to analysis of the longitudinal, cohort data presented in this paper, I performed supplementary analysis of the 2013-2014 cross-sectional sample of seventh and ninth graders. In this analysis, the odds of contacting teachers 5+ times per semester were significantly higher for corporate managers than they were for members of the working class ( $p < 0.001$ ).
- <sup>12</sup> Notably, contacting teachers may also influence whether teachers later contact parents – that is, parents’ behavior toward teachers can shape teachers’ behavior toward parents, just as the reverse is true. Consequently, the estimates produced after controlling for teacher-initiated contact with parents are conservative.
- <sup>13</sup> Moreover, a post-estimation test of the null hypothesis that there is no relationship between parent-teacher contact and teachers’ attention is statistically significant ( $p < 0.001$ ).
- <sup>14</sup> Put differently, students whose parents increase contact with teachers from never to 2-4 times between two survey years experience a 0.42 point increase in their score on the teachers’ attention scale, and students whose parents increase contact with teachers from once to 2-4 times between two survey years experience a 0.47 point increase in their score on the teachers’ attention scale.
- <sup>15</sup> Unlike in the case of standard regression analysis, one must make causal assumptions when engaging in structural equation modeling. Consequently, in this section I talk about testing

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with teachers, which remains statistically significant. In other words, there is little support for the idea that teachers are contacting the parents of students to whom they devote a lot of attention in the classroom, and that this is then leading the parents of those students to feel more comfortable contacting teachers.

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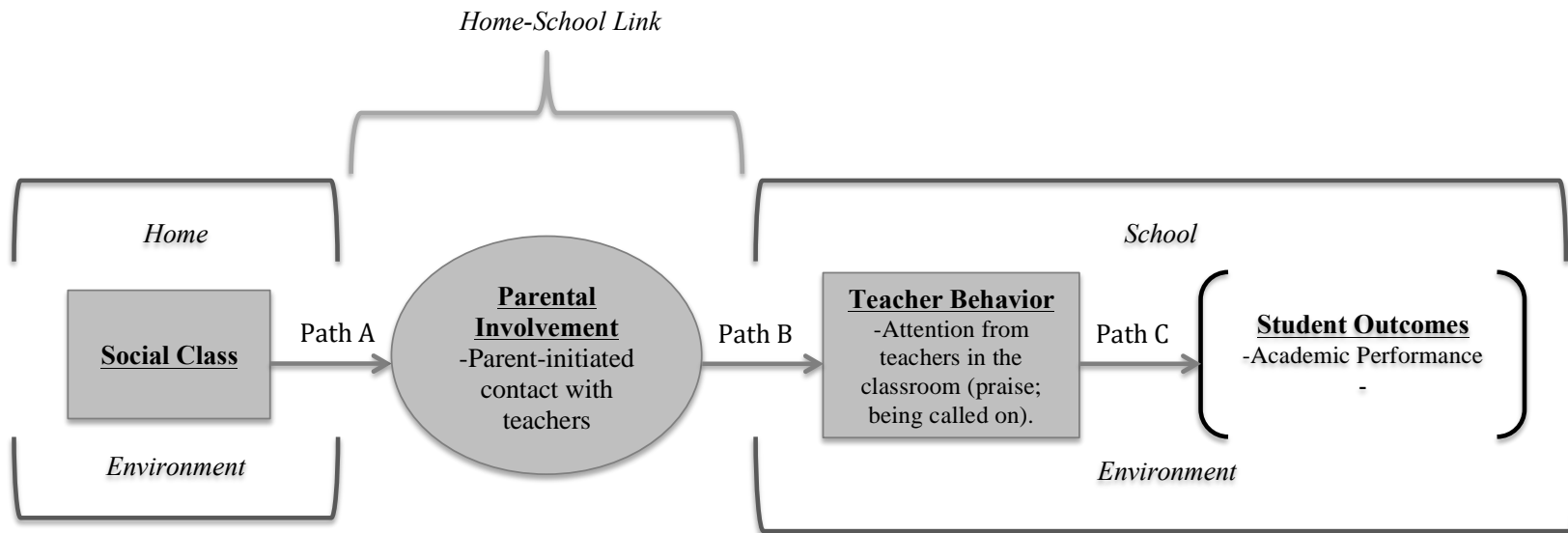
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## 8. Tables and Figures

Figure 1: Conceptual Model



Note: Although previous research has established other pathways through which social class shapes student outcomes, for simplicity of graphical presentation, only the pathway proposed in the current study is displayed in the figure.

Table 1: Descriptive Statistics for Variables in Models (weighted)

Variable	Mean or %	SD	Min	Max	Missing (%)
Parent-initiated contact with teachers					
Never	29.88		0	1	5.14
Once	19.75		0	1	5.14
2-4 times	35.65		0	1	5.14
5+ times	14.72		0	1	5.14
Score on “teachers’ attention” scale (7 <sup>th</sup> grade)	18.23	5.08	7	28	2.90
Score on “teachers’ attention” scale (8 <sup>th</sup> grade)	17.02	5.39	7	28	1.62
Parental occupation					
<i>Professional (%)</i>	8.41		0	1	2.22
<i>Government worker (%)</i>	5.30		0	1	2.22
<i>Corporate manager (%)</i>	4.74		0	1	2.22
<i>Small business owner (%)</i>	14.99		0	1	2.22
<i>Working class (%)</i>	66.57		0	1	2.22
Parental education					
<i>Elementary or less</i>	30.61		0	1	0.21
<i>Middle School</i>	49.01		0	1	0.21
<i>Academic High School</i>	12.32		0	1	0.21
<i>Tertiary</i>	8.06		0	1	0.21
Average grade on midterm exams (7 <sup>th</sup> grade)	68.86	13.60	17.48	94.69	2.86
Average grade on midterm exams (8 <sup>th</sup> grade)	67.80	14.44	23.40	93.27	1.71
Male (%)	52.70		0	1	1.81
Urban (%)	46.74		0	1	2.05
Agricultural household registration (%)	62.40		0	1	0.93
Migrant (%)	10.59		0	1	0.67
Ethnic minority (%)	14.38		0	1	0.31
Family structure					
<i>Both parents live with child (%)</i>	74.04		0	1	2.43
One or more siblings (%)	57.39		0	1	2.47
School Type					

<i>Public (%)</i>	91.26		0	1	0.00
<i>Private (%)</i>	8.74		0	1	0.00
School Rank					
<i>Lowest Rank (%)</i>	1.36		0	1	0.00
<i>Second Lowest Rank (%)</i>	4.87		0	1	0.00
<i>Middle Rank (%)</i>	10.58		0	1	0.00
<i>Second Highest Rank (%)</i>	63.01		0	1	0.00
<i>Highest Rank (%)</i>	20.18		0	1	0.00
Boarding School					
<i>All students live at school (%)</i>	27.09		0	1	0.00
<i>Some students live at school (%)</i>	48.44		0	1	0.00
<i>No students live at school (%)</i>	24.47		0	1	0.00
Score on psycho-social problems scale	2.12	0.84	1	5	2.51
Self-perception of grades, relative to classmates					
<i>Bad</i>	10.20		0	1	0.74
<i>Below average</i>	20.43		0	1	0.74
<i>Average</i>	32.01		0	1	0.74
<i>Above average</i>	29.49		0	1	0.74
<i>Very good</i>	7.86		0	1	0.74
Measures of Motivation and Engagement at School					
<i>Score on scale for "sense of belonging at school"</i>	2.98	0.71	1	4	0.93
<i>Score on scale for "academic confidence"</i>	3.12	0.57	1	4	3.59
<i>Score on scale for "academic motivation"</i>	3.26	0.71	1	4	3.39
<i>Score on scale for "perceived value of school"</i>	3.41	0.65	1	4	0.70
Sample Size	9449				

Table 2: Mixed Effects Logistic Regression of Cultivating Relationships with Teachers on Social Class

	Model 1	Model 2	Model 3
Parental occupation (Ref: Working class)			
<i>Professional</i>		0.625** (0.144)	
<i>Government worker</i>		0.454* (0.193)	
<i>Corporate manager</i>		0.273 (0.175)	
<i>Small business owner</i>		0.130 (0.146)	
Parental education (Ref: Middle school)			
<i>Elementary school</i>			0.0442 (0.141)

<i>Academic high school</i>			0.456*** (0.120)
<i>Tertiary education</i>			0.887*** (0.147)
Academic performance	0.005 (0.004)	0.004 (0.004)	0.004 (0.004)
Male	0.824*** (0.100)	0.830*** (0.099)	0.818*** (0.100)
Agricultural household registration	-0.328*** (0.087)	-0.238* (0.095)	-0.217* (0.091)
Migrant	-0.106 (0.188)	-0.105 (0.184)	-0.070 (0.185)
Minority	-0.454 (0.323)	-0.472 (0.322)	-0.479 (0.326)
Family structure (Both parents=1)	0.022 (0.091)	-0.001 (0.091)	-0.004 (0.088)
Sibling(s)	0.047 (0.095)	-0.007 (0.095)	-0.019 (0.094)
Urban area	0.107 (0.141)	0.064 (0.138)	0.062 (0.140)
School type (Private=1)	1.670*** (0.211)	1.702*** (0.216)	1.726*** (0.218)
School rank (Ref: Middle)			
<i>Lowest</i>	0.154 (0.440)	0.158 (0.446)	0.066 (0.436)
<i>2<sup>nd</sup> lowest</i>	0.640	0.613	0.635

	(0.367)	(0.362)	(0.369)
<i>2<sup>nd</sup> highest</i>	0.409 (0.219)	0.392 (0.216)	0.365 (0.221)
<i>Highest</i>	0.380 (0.246)	0.324 (0.249)	0.258 (0.252)
(continued)			
Boarding school			
(Ref: None board)			
<i>All board</i>	0.665 (0.357)	0.693* (0.348)	0.691* (0.346)
<i>Some board</i>	0.256 (0.288)	0.257 (0.282)	0.274 (0.281)
Control for county/district?	Yes	Yes	Yes

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Standard errors in parentheses. \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. N=16,592 (8,296 students observed at two time points)

Table 3: Mixed Effects Linear Regression of Teachers' Attention on Parent-Teacher Contact

	Model 1	Model 2	Model 3	Model 4
Frequency of parent-initiated contact with teachers (Ref: 2-4 times)				
<i>Never</i>		-0.872*** (0.128)	-0.621*** (0.114)	-0.509*** (0.106)
<i>Once</i>		-0.478*** (0.124)	-0.309** (0.112)	-0.253* (0.114)
<i>5+ times</i>		0.573** (0.192)	0.319* (0.148)	0.291 (0.160)
Parental occupation (Ref: Working class)				
<i>Professional</i>	0.483* (0.227)	0.376 (0.227)	0.169 (0.198)	0.162 (0.199)
<i>Government worker</i>	0.802* (0.269)	0.726** (0.260)	0.452 (0.276)	0.447 (0.275)
<i>Corporate manager</i>	0.585** (0.215)	0.514* (0.212)	0.189 (0.171)	0.186 (0.172)
<i>Small business owner</i>	0.018 (0.169)	-0.011 (0.170)	-0.120 (0.160)	-0.128 (0.160)



Parental education				
(Ref: Middle school)				
<i>Elementary school</i>	-0.237 (0.122)	-0.230 (0.132)	-0.156 (0.124)	-0.158 (0.124)
<i>Academic high school</i>	-0.089 (0.155)	-0.133 (0.152)	-0.186 (0.130)	-0.189 (0.131)
<i>Tertiary education</i>	0.720*** (0.186)	0.603** (0.187)	0.484** (0.157)	0.478** (0.159)
Academic performance	0.055*** (0.008)	0.055*** (0.008)	-0.00801 (0.00795)	-0.007 (0.008)
Male	0.030 (0.137)	-0.083 (0.135)	0.0598 (0.108)	0.041 (0.108)
Agricultural household registration	-0.132 (0.121)	0.164 (0.120)	0.178 (0.111)	0.178 (0.112)
Migrant	-0.066 (0.186)	0.055 (0.195)	0.0379 (0.174)	0.046 (0.173)
Minority	-0.446 (0.380)	-0.418 (0.378)	-0.191 (0.298)	-0.193 (0.295)
Family structure (Both parents=1)	0.402** (0.149)	0.401** (0.145)	0.218 (0.119)	0.212 (0.119)
Sibling(s)	0.018 (0.117)	0.027 (0.117)	0.0756 (0.107)	0.076 (0.108)
Urban area	-0.082 (0.299)	-0.125 (0.302)	-0.0676 (0.188)	-0.071 (0.188)
School type (Private=1)	1.323*** (0.314)	1.043** (0.318)	0.837*** (0.230)	0.825*** (0.229)

School rank				
(Ref: Middle)				
<i>Lowest</i>	-0.372 (0.809)	-0.350 (0.727)	-0.480 (0.449)	-0.464 (0.494)
<i>2<sup>nd</sup> Lowest</i>	-0.768 (0.858)	0.746 (0.839)	0.285 (0.516)	0.287 (0.514)
<i>2<sup>nd</sup> Highest</i>	0.651 (0.615)	0.613 (0.604)	0.339 (0.335)	0.335 (0.334)
<i>Highest</i>	0.316 (0.608)	0.255 (0.594)	0.100 (0.350)	0.076 (0.350)
Boarding school				
(Ref: None board)				
<i>All board</i>	-0.241 (0.708)	-0.363 (0.683)	0.046 (0.568)	0.037 (0.569)
<i>Some board</i>	-0.687 (0.701)	-0.735 (0.682)	-0.266 (0.574)	-0.277 (0.575)
Psycho-social Problems			-0.085 (0.062)	-0.087 (0.062)
Self-perception of grades, relative to classmates				
(Ref: Average)				
<i>Bad</i>			-0.820*** (0.191)	-0.829*** (0.190)
<i>Below Average</i>			-0.432*** (0.134)	-0.437** (0.133)
<i>Above Average</i>			0.325* (0.136)	0.330* (0.137)
<i>Very Good</i>			0.865***	0.868***

			(0.217)	(0.216)
Scales for motivation and engagement at school				
<i>Sense of belonging at school</i>			2.369***	2.366***
			(0.130)	(0.129)
<i>Confidence in academic skills</i>			0.570***	0.569***
			(0.110)	(0.110)
<i>Perceived value of school to one's future</i>			0.813***	0.812***
			(0.103)	(0.103)
<i>Academic motivation</i>			0.756***	0.759***
			(0.092)	(0.092)
Frequency of teacher-initiated contact with parents				
(Ref: 2-4 times)				
<i>Never</i>				-0.279*
				(0.106)
<i>Once</i>				-0.096
				(0.135)
<i>5+ Times</i>				-0.026
				(0.160)
Control for county/district?	Yes	Yes	Yes	Yes

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Standard errors in parentheses. \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. N=15,466 (7,723 students observed at two time points)

Table 4: Fixed Effects Linear Regression of Teachers' Attention on Parent-Teacher Contact

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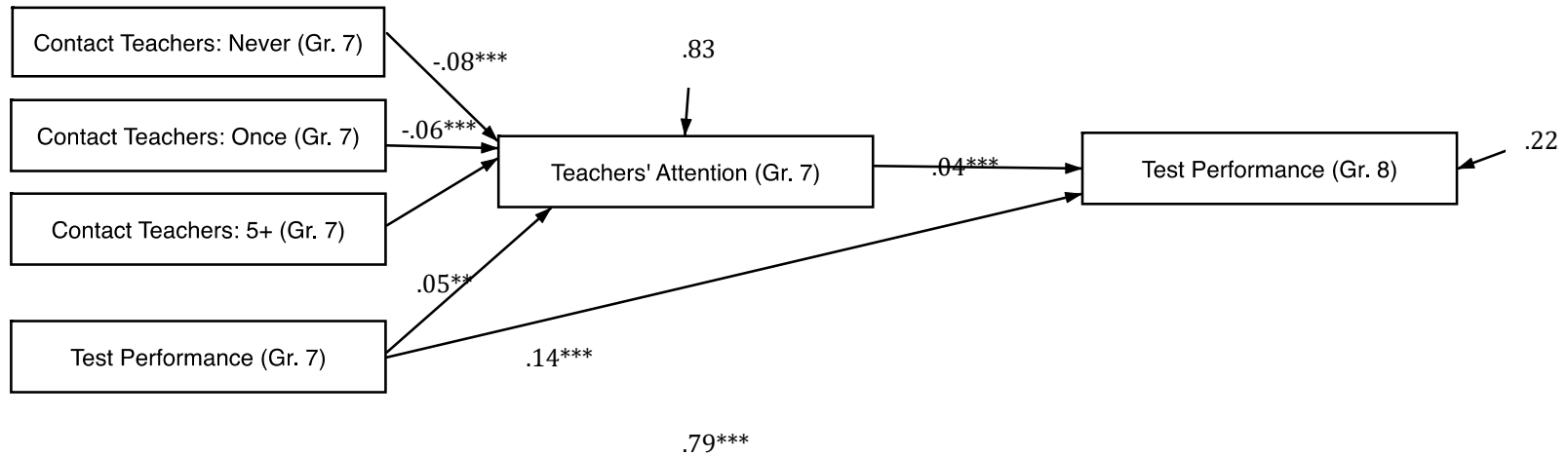
Frequency of parent-initiated contact with teachers  
(Ref: 2-4 times)

<i>Never</i>	-0.423*	(0.186)
<i>Once</i>	-0.473**	(0.169)
<i>5+ times</i>	0.024	(0.230)
Academic performance	0.017	(0.014)

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Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . N=17,621 (9,348 students observed at two time points)

Figure 2: Structural Equation Model: Indirect Effect of Parent-Teacher Contact on Later Academic Performance



Notes: Standardized coefficients reported on each of the dummy variables for parent-teacher contact are based on a comparison to the reference category of contacting teachers 2-4 times. The following covariates are included in analysis but not displayed in the visual representation above: parental occupation, parental education, gender, household registration (*hukou*) type, migrant status, minority status, family structure, whether the child has siblings, school location (urban vs. non-urban), school type (public vs. private), school rank, whether the school is a boarding school, and county.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

