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Are there educational and psychological benefits from parental school involvement for early adolescents? Evidence from the China Educational Panel Survey(CEPS)

By

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Abstract

This study focused on adolescents in China and examined the educational and psychological effects of parental participation in school meetings. Applying propensity score stratification and hierarchical linear modeling, this study shows a positive impact of parental participation (versus non-participation) on students' cognitive scores and psychological well-being. While advantaged parents are more likely to attend the meetings, parental participation may have added rewards for students with lower pre-test achievement and at schools with lower-SES parents. This finding is in line with earlier research, suggesting that the children who would benefit most from parental involvement are those who are least likely to receive it. Such findings reveal the unique barriers faced by disadvantaged families, highlighting the imperative of policies or programs to identify strategies to increase participation. Moreover, despite the positive influence, the small effect size on students' outcomes indicates the necessity of considering the characteristics of early adolescent development and unique family dynamics during adolescence to promote developmentally appropriate and effective parental involvement.

1. Introduction

Developing family-school collaboration as a way to promote students' outcomes has a long-standing basis in research and is the focus of numerous programs and policies (Epstein, 1991; Comer 1995; Lareau 1996; Hill & Craft, 2003; Zhang 2011; Sheridan et al., 2017). The Chinese government recognizes the importance of home-school cooperation and has made policies aiming at promoting parental school involvement. In 2017, the "School Management Standards for Compulsory Education" proposed that harmonious relationships among family, school, and community should be built to enhance parents' participation in school governance and form a joint effort to educate people(Ministry of Education 2017).

Extant research has agreed on two mechanisms through which parental school involvement brings benefits to students' academic achievement. Social capital theory demonstrates how parents gain information and parenting strategies through interaction with school personnel and other parents, which facilitates their involvement in students' schoolwork and skill development(Lareau, 1996). Social control theory places an emphasis on the cooperative efforts between parents and school. Such cooperation establishes a shared understanding of acceptable conduct that is effectively transmitted to children within both the home and school environments(Grolnick & Slowiaczek 1994; McNeal 1999). Through both social capital and social control, students receive messages emphasizing the importance of schooling. These messages have a positive impact on children's competence, motivation to learn, and engagement in school.

Despite consensus about the positive impact of family-school cooperation, existing theories and research have been largely based on early childhood and elementary school contexts. These studies did not account for the changes and unique

dynamics associated with middle school contexts and early adolescent development. As some research indicated, adolescents' desire for autonomy and independence is associated with their increasing reluctance to have their parents visit the school (Stevenson & Baker, 1987). Overall, there are increased challenges associated with maintaining parental involvement with adolescents who are increasingly autonomous and independent and in middle schools that are larger and more bureaucratic(Hill & Tyson, 2009).

Additionally, emerging studies complicate the discussion on the effect of parental school involvement. This group of research makes a critical argument that parent-school cooperation perpetuates educational inequalities in a way that parental involvement can be better seized by parents of higher socioeconomic status(Lareau, 2003; Fergusson et al., 2008; McLanahan & Percheski, 2008; Kwan & Wong, 2016; Calarco 2018). From this perspective, parents of different social classes do not enjoy an equal access to school-based involvement. Moreover, the quality of family-school cooperation differs by parent's socioeconomic background, leading to disparity in the educational outcomes. Parents having more resources, of various kinds, are found to be more likely and more capable of promoting the educational outcomes for their children(Kwan and Wong 2016). In this sense, an advocacy of parental involvement may perpetuate the existing class inequality in education.

Therefore, to build up research that is based on middle-school contexts and less explored, this study will focus on adolescents in China to account for the unique dynamics during adolescent development. In addition to a focus on academic achievement, this study also investigates the psychological outcomes from parental school involvement. This will provide a more comprehensive understanding of the impact of parental school involvement. Additionally, to examine the potential

disparity in parental involvement, this study also tests the factors predicting parental participation, and the moderation effect of parental SES. The research questions are:

1. What are the educational and psychological effects of parental participation for early adolescents in China?
2. What factors can influence parental participation in the school meeting?
3. Do the effects vary across schools and individuals of different socio-demographic backgrounds?

2. Theoretical Background and Chinese Context

2.1 Social capital and parents' skills

The existing research generally agreed on two mechanisms by which parental school involvement promotes students' achievement. The first is through social capital. From the sociological perspective, parent-school cooperation increases parents' social capital, making them better equipped with information and skills to support their children in succeeding in school. Through attending school events such as parent-teacher conferences or open houses, parents build social networks that can provide connections to the school personnel. As parents establish a relationship with the school, they obtain a better understanding of the school's expectations for behavior and homework, which are important for student' s success at school(Lareau, 1996).

Parents also meet other parents, with whom they can exchange insight on school practices, parenting strategies and extracurricular activities. In addition, parents have the chance to interact with the teachers, learning about teachers' expectations for their children and their children's teachers(Hill & Tyson, 2009). These family-school interactions provide parents with knowledge about how and what their children are learning(e.g., instructional styles and course content), which

facilitate the development of skills among children(Baker & Stevenson, 1986). Studies have found that involved parents exhibited more sophisticated strategies for fostering children's academic success, compared with less-involved parents(Baker & Stevenson, 1986).

Importantly, the two benefits from parental school involvement -- understanding the school's expectations and developing parenting strategies are particularly important for children from less-advantaged families. Lareau and Calarco's studies(2003; 2018)identified the disadvantage for the less-educated parents of having little knowledge of the rules of games. Ill-equipped with skills for interacting with institutional personnel(such as the teacher), their children tend to gain less favorable results at school. In this sense, school-family connections, such as the parent-teacher meeting can provide these families with important knowledge of the school's operations, expectations, as well as information on developing optimal parenting strategies that help their children succeed at school.

2.2 Parental involvement and student's stimulated academic motivation

The second mechanism is the transmission and internalization of parents' values, which promote children's academic motivation. On one hand, parents tend to highlight the value of school when involved in children's schooling(Epstein 1988, Hill et al., 2004). Internalizing the value over time, children are therefore motivated to become more engaged in school(Cheung & Pomerantz 2012). On the other hand, parental involvement communicates to children that they have control over their learning by showing them how to tackle learning and its accompanying challenges. For example, by contacting a teacher when children are having a problem, parents show the children a way of learning in which they take control of the situation(Grolnick & Slowiaczek 1994). In this way, parents model an active and

engaged approach to learning that their children can learn from(Barger et al., 2019). In alignment with this perspective, Calarco's(2018) ethnographic study demonstrates how middle-class parents coach children to use class-based strategies for managing challenges and how children internalize those lessons(p.27). Noticeably, this group of research takes a critical perspective on parental school involvement, pointing out the class-based disparity in parents' resources. This perspective will be discussed in the later part of this study.

Aside from the effect from parent's side, social control theory(Grolnick & Slowiaczek 1994; McNeal 1999; Hill & Tyson 2009) demonstrates how the collaborative efforts between parents and schools reduce problem behaviors and increase children's engagement in school. Social control occurs when there is a collaborative effort of families and schools to establish a shared understanding of acceptable conduct, which can be effectively transmitted to children within both the home and school environments. When children and their peers receive consistent messages regarding appropriate behavior from various sources and across settings, these messages become salient and clear, reducing any ambiguity about expectations (McNeal, 1999; Hill & Tyson 2009). Overall, through both social capital and social control, students receive messages emphasizing the importance of schooling. These messages have a positive impact on children's competence, motivation to learn, and engagement in school.

Although social control theory has an emphasis on the positive impact, such a mechanism also implies the potential negative effect on students' psychological well-being, especially for the early adolescents who are experiencing an increased desire for autonomy and independence. The following part will discuss the potential

problems and barriers associated with maintaining parental involvement during adolescence, a less-explored developmental stage in the literature.

2.3 A less-explored developmental stage: early adolescence

Despite consensus about the positive impact of family-school cooperation, extant theories and research have been based on early childhood and elementary school contexts. These studies did not account for the changes and unique dynamics associated with middle school contexts and early adolescent development(Hill & Tyson, 2009). As outlined in research, adolescence is characterized by dramatic cognitive development and an increasing conceptualization of the self as an autonomous, efficacious individual(Adams & Berzonsky, 2003; Lerner & Steinberg, 2004). Cognitively, adolescents have an increased ability to play a more active role in their education. Psychologically and emotionally, their desire for autonomy is associated with their increasing reluctance to have their parents visit the school(Stevenson & Baker 1987, Hill & Tyson 2009). Therefore, the effect of parental involvement in middle school may not be as beneficial as in elementary school and kindergarten.

Indeed, in China, there has been a shift in perspective regarding parental involvement, particularly concerning adolescents' psychological well-being and the potential negative impact of parental involvement centered solely on academic success. The fact that Chinese parents are willing to expend great efforts to ensure that their children succeed academically is well documented(Zou, Anderson, & Tsey, 2013). Research on this subject, however, have started to report an increased level of stress, anxiety and depression associated with high parental expectation among students in junior high and high school in China(Sun et al., 2013; Jiang et al. 2021). Moreover, as adolescents strive for independence and autonomy, parental school

involvement can be seen as intrusive of their personal space(Wang & Cai, 2017). During this developmental stage, authoritarian and intrusive parenting practices can bring negative influence on students' psychological states. However, the psychological outcomes from parental school involvement in middle school is less explored in research, especially in the middle-school context in China.

2.4 A critique: class-based disparity in parental involvement

In addition to the critical perspective on psychological outcomes, emerging studies complicate the effect of parental-school involvement by highlighting the class-based disparity in parental-school involvement. Research found that the access to and effect of parental school involvement vary across parents from different socio-economic backgrounds(Wong 2007; Kwan and Wong 2016). Specifically, parent-school cooperation requires not only certain time but also certain knowledge about the operation of school systems. Consequently, parents of lower SES face many more barriers to involvement, including nonflexible work schedules, lack of resources, transportations problems and a stress residing in a disadvantaged neighborhood(Hill & Taylor 2004). These kinds of barriers make them could not afford to engage in the parent-school relationship(Fergusson et al., 2008; McLanahan & Percheski 2008). Moreover, parents with low or no education are also less likely to effectively participate in the parent-school cooperation compared with more educated parents. As they potentially harbor more negative experiences with schools, they often feel ill-equipped to interact with the teacher or school(Lareau, 1996). In this sense, an advocacy of parental involvement may perpetuate the existing class inequality in education.

Despite this, Dearing and colleagues(2004; 2006) also found that the achievement gap between children of more and less educated mothers diminishes over

time if parental involvement levels were high. This result indicates that high levels of involvement may have added rewards for low-SES children. In line with such a finding, other studies found that among low-income families, school-based involvement predicts enhanced academic achievement to a greater context among children of less(versus more) educated parents(Monti et al., 2014). Researchers reason that children are at heightened risk academically when their parent's income and education are limited. These research indicates that children living in low-income families display lower levels of academic self-efficacy and achievement relative to other children(e.g., Bandura et al., 1996; Taylor, Dearing, & McCartney, 2004). As a result, children are in greater need of the resources provided by parental involvement and therefore, benefit more than their counterparts of higher socioeconomic families (Dearing et al., 2004; 2006; Boonk et al., 2018; Barger 2019).

These findings suggest that although parents from lower-SES are less likely to involve in school-based activities, the effect of their involvement can be highly beneficial to their children. In other words, the children who would benefit most from parental involvement are those who are least likely to receive it, unless proactive effort is made(Hill & Taylor, 2004). Therefore, school policies become important in terms of involving parents who are facing barriers. For instance, teacher's encouragement has been found to be associated with greater parental competency in school-based involvement(Epstein & Dauber, 1991).

2.5 Study Aims

Based on the existing theory and literature, this study will focus on adolescents in China to explore the educational and psychological outcomes from parental participation in the school meeting. The objective of this study is to examine: 1)the demographic and personal factors predicting parent's participation in the school

meeting, and 2) the educational and psychological outcomes from parental participation and the moderation effects of parental SES and school-level policies. Together, these questions provide a more comprehensive understanding of the effect of parental school involvement on adolescents, not only on academic outcomes but also on psychological well-being. Additionally, these questions address the potential benefits as well as barriers for the disadvantaged students, which highlight the important role of school policies in addressing these barriers to establish effective collaborations.

3. Data

3.1 China Educational Panel Survey (CEPS)

My data is obtained from CEPS, a longitudinal survey starting with the 7th and 9th graders. The first wave of data was collected in the 2013-2014 academic year, with a follow-up survey in 2014-2015. CEPS randomly selected a school-based, nationally representative sample of approximately 20,000 students in 112 schools across 28 county-level units in China. The CEPS administrated different questionnaires to the sample students, parents, and school principals. These data contain widespread information on individual, household and school-level characteristics, which align with the objective of this study. I will draw data from the student questionnaire, parent questionnaire, and school principal questionnaire. After merging the two waves' data, I got a sample of approximately 9,217 students in 112 schools present in both waves. Since the 9th graders in wave 1 were graduated before the wave-2 investigation, the follow-up investigation only focused on the 7th graders in wave1, who turned to 8th graders during the follow-up investigation. The follow-up rate is 91.9% and 830 students were lost during the second wave.

3.2 Outcome variables

The outcome variables are students' academic achievement and self-reported psychological well-being. Students' academic achievement is measured by wave 2 cognitive ability scores. The cognitive ability test is designed to assess students' logical thinking and problem-solving abilities. The test covers three main areas, including language, graphics and computation. The test is internationally comparable and fully standardized. The homeroom teacher and surveyor administrated the test to the students within the classroom. Students' survey was conducted right after the test. Parents' survey was conducted around the same day, collecting data on parental participation in school's meeting since this semester, which is between wave 1 and wave 2. This timeline ensures that the treatment occurred prior to the outcomes.

To measure psychological benefits, I draw questions from students' questionnaire asking the students "Have you had the following feelings in the past seven days?". The sub questions included eight feelings: feeling blue, too depressed to focus on anything, unhappy, not enjoying life, having no passion to do anything, sad, nervous, and excessively worried. The options were 1=never, 2=seldom, 3=sometimes, 4=often, and 5= always. I aggregated the eight sub questions and obtain a total score as an indicator of psychological benefits. The higher the score is, more often the students experience adverse psychological states, and fewer psychological benefits they obtain. However, the CEPS did not contain a clinical, objective assessment of the students' psychological state. The outcome measures students' subjective psychological states.

3.3 Independent variables

The treatment variable is a dummy variable indicating parental participation in their school's regularly held meeting. The CEPS asked parents "Do this child's parents attend the parent meeting this semester?" and I coded 1 as attended, 0 as did not attend. In order to alleviate the endogeneity problem, I choose school meeting as

the independent variables because it is a regularly-held, school-initiated activity. Studies have found that parents tend to involve in schooling when their children are having trouble at school. A regularly-held, school-wide activity can therefore reduce such endogeneity problems to some extent.

I also consider the following student, family and school covariates: gender(female=1, male=0), household registration status, also known as hukou(urban=1, rural=0), family financial condition: poor or very poor(yes=1,no=0), mother's education: elementary school or no education(yes=1, no=1), middle school(yes=1, no=0), high school(yes=1, no=0), college or higher(yes=1, no=0), father's occupational type: (elite=1, non-elite=0), number of siblings, living arrangement: live with parents(yes=1, no=0), wave 1 cognitive ability test score, wave 1 teacher-initiated contact(yes=1, no=0), school location(rural=1, urban=0), school's average parental income level(low=1, high=0), school's average parental education level(low=1, high=0), and school's parental involvement policy(high=1, low=0).

For the missing values in continuous variables, I imputed the mean value. For the missing values in categorical variables, I created a dummy missing indicator and included it in the analysis. For example, for the missing values in mother's education, I imputed 0 for them and I created a dummy indicator--mother's education missing(1=yes, 0=no). In the analysis, I included the four dummy variables: middle school(yes=1, no=0), high school(yes=1, no=0), college or higher mother, and mother's education missing(yes=1, no=0), using elementary or no education as the reference group.

Table 1 shows the summary statistics. In general, I found that 73.1% parents attended the school meeting.

Table 1 *Descriptive statistics for the variables*

Variables		N	Mean	SD	Min.	Max.
Independent Variable	Parental Participation (yes=1, no=0)	9212	0.731	0.4436	0	1
Dependent Variables	Standard Cognitive Ability Scores Wave2	9212	0.314	0.7940	-3.137	2.063
	Self-reported Adverse Psychological Well-being	9212	21.78	7.7380	10	50
Covariates	Female (yes=1, no=0)	9212	0.473	0.7939	0	1
	Hukou (urban=1, rural=0)	9212	0.439	0.3873	0	1
	Mother's Education: Elementary school or None	9212	0.204	0.3510	0	1
	Mother's Education: Middle school	9212	0.467	0.4938	0	1
	Mother's Education: High school	9212	0.144	0.3361	0	1
	Mother's education: College or higher	9212	0.160	0.3507	0	1
	Family financial condition (below average)	9212	0.205	0.2196	0	1
	Father's occupation type (Elite)	9212	0.212	0.3931	0	1
	Siblings	9212	0.705	0.8826	0	12
	Live with parent	9212	0.833	0.3813	0	1
	Teacher-initiated contact with parent	9212	0.689	0.4621	0	1
	Standard cognitive ability scores wave1	9212	0.004	0.8728	-2.029	2.333
	Public school	112	0.929	0.2587	0	1
	Private school	112	0.054	0.2262	0	1
	Private school for migrant workers' children	112	0.018	0.1330	0	1
	Location (urban=1, rural=0)	112	0.482	0.5019	0	1
	Average parental education (Low=1,H=0)	112	0.357	0.4756	0	1
	Average parental income (Low=1,H=0)	112	0.339	0.4813	0	1

4. Method & Data analysis

4.1 Propensity Score Stratification (PSS)

The central aim of this study is to examine the effect of parental participation on students' educational and psychological outcomes. To do so, one important assumption is random sample selection. However, parents who attended school meeting have differences in demographic characteristics and other parental characteristics that are not randomly assigned. To address the selection biases problem, this study first conducts a propensity score stratification(PSS). PSS groups individuals into strata based on their estimated propensity scores, which represent the

probability of attending the meeting given the observed covariate variables. Within each stratum, the likelihood of attending a meeting is identical for the treatment and control groups, which helps reduce the effect of selection biases. Overall, the end goal of PSS is to have treatment and control groups that are substantively identical based on a large number of covariates.

After controlling for the stratum, this study can then investigate the causal effect of the treatment variable under certain assumptions. These assumptions include that there are no unobserved covariates that affect both the treatment and outcome, and that there is only one version of the treatment. By conducting PSS, this study also provides information on the characteristics of parents and students that influence parental participation, and the likelihood of participation.

The model for propensity score stratification is shown below:

$$\text{Prob}\,(\text{PARTICIPATION}_{ij}=1|\beta_j) = \phi_{ij}$$

$$log\,(\frac{\phi ij}{1\,-\,\phi ij}) = \eta ij$$

$$\eta_{ij} = \beta_{0j} + \beta_{1j}X_{1ij} + \beta_{2j}X_{2ij} + \cdots + \beta_{18j}X_{18ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{00}$$

$$\beta_{sj} = \gamma_{s0}, \text{ for } s = 2, \ldots, 18$$

ϕ_{ij} = Probability of a parent attending the school's regular meeting conditional on all covariates

η_{ij} = Log odds of $\phi_{ij.}$

β_{0j} = Log odds of a parent attending the meeting when all predictor variables are centered around their grand mean

$\beta_{1j} \cdots \beta_{18j}$ = Differences in log odds between one group and the reference group in one of the predictors for Gender, hukou status, family financial condition, mother's education, father's occupation, living arrangements, and teacher-initiated contact; or Changes in log odds for one unit change in one of the continuous predictors for number of siblings and pre-test cognitive scores

γ_{00} = Estimated mean log odds of the whole sample

u_{0j} = School-specific variation in β_{0j}

4.2 Part A Results

Table 2 shows the results of the logistic regression model.

Table2 *Factors that influence parental participation*

Fixed Effect	Coefficient	Standard Error	Approx. *d.f.*
For INTRCPT1, β_0			
INTRCPT2, γ_{00}	1.0922***	0.0259	9211
For COGSC1 slope, β_1			
INTRCPT2, γ_{10}	0.1535***	0.0299	9194
For GENDER slope, β_2			
INTRCPT2, γ_{20}	0.1058**	0.0513	9194
For GENDER MISSING slope, β_3			
INTRCPT2, γ_{30}	-0.0012	0.1826	9194
For HUKOU slope, β_4			
INTRCPT2, γ_{40}	0.4868***	0.0590	9194
For HUKOU MISSING slope, β_5			
INTRCPT2, γ_{50}	0.1083	0.0944	9194
For FAMILY FINANCIAL CONDITION POOR slope, β_6			
INTRCPT2, γ_{60}	-0.1402***	0.1878	9194
For FAMILY FINANCIAL CONDITION MISSING slope, β_7			
INTRCPT2, γ_{70}	0.0524	0.1132	9194
For FATHERS OCCUPATION EIITE slope, β_8			
INTRCPT2, γ_{80}	0.0922	0.1040	9194

For FATHER'S OCCUPATION MISSING slope, β_9			
INTRCPT2, γ_{90}	0.0563	0.0786	9194
For SIBLINGS slope, β_{10}			
INTRCPT2, γ_{100}	-0.2763***	0.0311	9194
For LIVE WITH PARENTS slope, β_{11}			
INTRCPT2, γ_{110}	0.5904***	0.0311	9194
For LIVEWLP MISSING slope, β_{12}			
INTRCPT2, γ_{120}	0.5267**	0.0678	9194
For TEACHER-INITIATED CONTACT1 slope, β_{13}			
INTRCPT2, γ_{130}	0.5267***	0.1719	9194
For TEACHER-INITIATED CONTACT MISSING slope, β_{14}			
INTRCPT2, γ_{140}	0.2794	0.0552	9194
For MIDDLE SCHOOL MOTHER slope, β_{15}			
INTRCPT2, γ_{150}	0.2273***	0.1521	9194
For HIGH SCHOOL MOTHER slope, β_{16}			
INTRCPT2, γ_{160}	0.3949***	0.0621	9194
For COLLEGE OR HIGHER MOTHERij slope, β_{17}			
INTRCPT2, γ_{170}	0.4970***	0.0881	9194
For MOTHER EDUCATION MISSING slope, β_{18}			
INTRCPT2, γ_{180}	0.5885	0.1083	9194

*** p<0.01, ** p<0.05, * p<0.1

Prior to the logistic regression modeling, based on the existing research and theories, this study conducted bi-variate regression analysis to identify the variables that are related to parental participation. The logistic regression model then includes all these variables to predict parental participation. Holding constant all other covariates, for every increase in mother's education level--from elementary school to middle school, to high school and to college or higher, there is an increase in log odds of participation. And the higher the mother's education level, the larger the increase is. Compared to a mother with elementary or no education, there is a 0.2273 increase in the log odds of participation for a mother of middle-school education($p<0.001$), a

0.3949 increase for a mother of high-school education($p<0.001$), and a 0.4970 increase for a mother of college or higher education($p<0.001$). To obtain the increase in probability, this study uses the equation $\exp(\eta_{ij}) / (1 + \exp(\eta_{ij}))$. Subtracting the likelihood of participation of the reference group, the result shows that there is a 4.03, 6.68 and 9.86 percentage point increase in the likelihood of parental participation when the mother's education changes from elementary school to middle school, high school and college or high, respectively.

Urban-hukou students versus rural hukou students increase the log odds of parental participation by 0.4868($p<0.001$), which means that the likelihood of parental participation is 8.07% higher for the urban-hukou students, compared with rural-hukou students. Additionally, having a higher pre-test score, being a female student, living with parents, having a smaller number of siblings, and having parents contacted by the teacher increased the likelihood of parental participation. Father's occupation type has a less significant effect on parental participation when controlling for other covariates. In summary, every indicator of relative advantage positively predicts parental participation in school meetings. The results support previous studies and suggest that advantaged parents are more likely to attend the school meeting.

Then, this study ranks the students by the logit of the predicted propensity scores and divide the sample into 10 strata based on it. Graph 1 shows two histograms of predicted propensity scores. The graph above displays parents not participating the meeting and the graph below displays parents participating in the meeting. The graphs show an overlap range of propensity scores between the treated and control groups. I identified the common support area and eliminated data below the highest minimum and above the lowest maximum of propensity scores. 5 observations were eliminated. This ensures that I am analyzing reasonably-comparable students . For each student

whose parents attended school meetings, there are similar students whose parents did not, and vice versa.

Graph 1 *The histogram of predicted logit-propensity score by parent's participation (1)versus non-participation(0)*

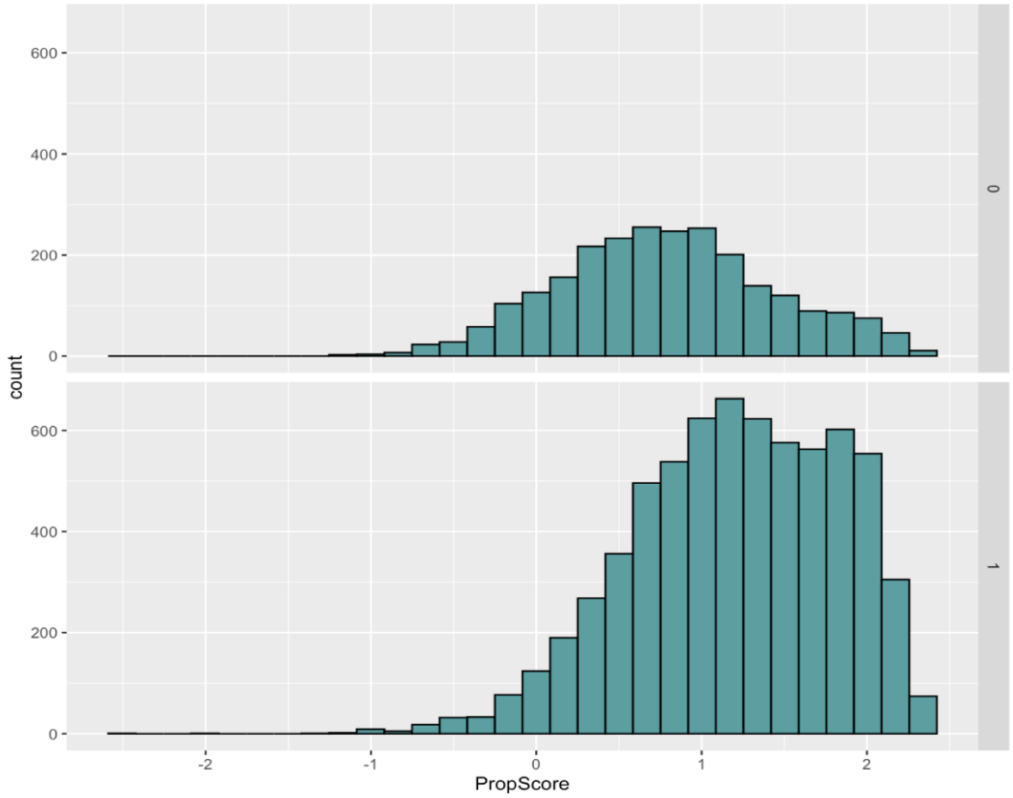


Table 3 shows the mean difference in cognitive scores and psychological outcomes within each of the stratum. To check the balance, this study regressed each covariate on treatment, controlling for the dummy indicators for the propensity strata. The results showed no statistically significant effect of any of the covariates on parental participation.

Table3 *Propensity Stratification Based on logit of* ϕ_{ij}
(Within-Stratum Mean Difference in outcomes)

Parental Participation in School Meeting			
Stratum		Participation	Non-participation
1	N	448	474
	Propensity Score MEAN	-0.1081	-0.1252
	Cognitive Score MEAN	-0.1129	-0.097
	Cognitive Score DIFF		**-0.0159**
	Psychological cores MEAN	23.366	23.7463

	Psychological cores DIFF		**-0.3803**
2	N	520	401
	Propensity Score MEAN	0.3828	0.3702
	Cognitive Score MEAN	0.0165	0.0782
	Cognitive Score DIFF		**0.0782**
	Psychological cores MEAN	22.1626	22.8737
	Psychological cores DIFF		**-0.7111**
3	N	600	321
	Propensity Score MEAN	0.6358	0.6363
	Cognitive Score MEAN	0.0439	-0.1204
	Cognitive Score DIFF		**0.1643**
	Psychological cores MEAN	22.2309	22.8454
	Psychological cores DIFF		**-0.6145**
4	N	627	294
	Propensity Score MEAN	0.8362	0.847
	Cognitive Score MEAN	0.2062	0.1404
	Cognitive Score DIFF		**0.0658**
	Psychological cores MEAN	21.6111	22.6686
	Psychological cores DIFF		**-1.0575**
5	N	663	258
	Propensity Score MEAN	1.0201	1.0286
	Cognitive Score MEAN	0.2414	0.2321
	Cognitive Score DIFF		**0.0092**
	Psychological cores MEAN	21.9969	22.3782
	Psychological cores DIFF		**-0.3813**
6	N	726	195
	Propensity Score MEAN	1.1966	1.1956
	Cognitive Score MEAN	0.3784	0.3549
	Cognitive Score DIFF		**0.0234**
	Psychological cores MEAN	20.9175	21.0789
	Psychological cores DIFF		**-0.1614**
7	N	740	181
	Propensity Score MEAN	1.3931	1.3985
	Cognitive Score MEAN	0.4502	0.3699
	Cognitive Score DIFF		**0.0803**
	Psychological cores MEAN	21.1245	22.8242
	Psychological cores DIFF		**-1.6997**
8	N	794	127
	Propensity Score MEAN	1.617	1.6151
	Cognitive Score MEAN	0.4634	0.6399
	Cognitive Score DIFF		**-0.1765**
	Psychological cores MEAN	21.7049	21.7846
	Psychological cores DIFF		**-0.0797**

9	N	804	117
	Propensity Score MEAN	1.8433	1.8431
	Cognitive Score MEAN	0.6161	0.6469
	Cognitive Score DIFF		**-0.0308**
	Psychological cores MEAN	21.7049	21.7846
	Psychological cores DIFF		**-0.0797**
10	N	809	113
	Propensity Score MEAN	2.1006	2.0912
	Cognitive Score MEAN	0.8662	0.8175
	Cognitive Score DIFF		**0.0486**
	Psychological cores MEAN	20.1505	20.5893
	Psychological cores DIFF		**-0.4388**

4.2 Hierarchical Linear Model(HLM)

Since students are nested in schools that have different characteristics that may influence the treatment effect, this study uses hierarchical linear model to control for the contextual effects of schools. HLM allows for the estimation of both between-group variation and within-group variation simultaneously. Therefore, by using HLM, this paper provides answer to one of the research questions exploring the differential effect by school-level characteristics.

4.3 Treatment effect

After conducting the propensity score stratification, this study then tested the treatment effect. By using a hierarchical linear model, this study considers the hierarchical structure and controls for the contextual effect of schools. The components for the basic model are shown below:

Level-1 Model

$$COGNITIVE\ SCORE_{ij} = \beta_{0j} + \beta_{1j}*(PARTICIPATION_{ij}) + \beta_{2j}*(STRAT2_{ij}) + \beta_{3j}*(STRAT3_{ij}) + \beta_{4j}*(STRAT4_{ij}) + \beta_{5j}*(STRAT5_{ij}) + \beta_{6j}*(STRAT6_{ij}) + \beta_{7j}*(STRAT7_{ij}) + \beta_{8j}*(STRAT8_{ij}) + \beta_{9j}*(STRAT9_{ij}) + \beta_{10j}*(STRAT10_{ij}) + r_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\beta_{sj} = \gamma_{s0}, \text{ for } s = 2, \ldots, 10$$

COGNITIVE SCOREij = Cognitive score of student *i* in school *j*

PARTICIPATIONij = Parental participation for student *i* in school *j,* where parental participation is 1 and non-participation is 0

STRAT2ij … STRAT10ij = Dummy indicators for the propensity score strata

β_{0j} = Mean cognitive score for students whose parents did not attend the meeting at school *j*

γ_{00} = Mean cognitive score for students whose parents did not attend the meeting averaged across schools

u_{0j} = School-specific variation in β_{0j}

β_{1j} = Estimated effect of parental participation for students at school *j*

γ_{10} = Estimated effect of parental participation averaged across schools

u_{1j} = School-specific variation in β_{1j}

r_{1j} = Student-specific variation in *COGNITIVE SCOREij*

$\gamma_{20 \ldots} \gamma_{100}$ = Coefficients for the twelve strata

To investigate the psychological outcomes, this study used students' self-reported psychological well-being as the outcome variable. The other parts of the model remain unchanged.

4.4 Part B Results

The results of Model 1 and Model 2 are shown in Table4.

Table4 *The effect of parental participation (Hierarchical Linear model)*

Fixed Effect	Model1 (Cognitive Score)	Model2 (Adverse Psychological Score)	Approx. *d.f.*
For INTRCPT1, β_0			

INTRCPT2, γ_{00}	-0.0143 (0.0360)	23.6061*** (0.3374)	111
For PARTICIPATION slope, β_1			
INTRCPT2, γ_{10}	0.0548** (0.0273)	-0.4721** (0.2343)	111
For STRAT2 slope, β_2			
INTRCPT2, γ_{20}	0.0983** (0.0366)	-0.8906*** (0.3861)	8981
For STRAT3 slope, β_3			
INTRCPT2, γ_{30}	0.07504** (0.0366)	-0.7992** (0.3815)	8981
For STRAT4 slope, β_4			
INTRCPT2, γ_{40}	0.1861*** (0.0448)	-1.3741*** (0.3861)	8981
For STRAT5 slope, β_5			
INTRCPT2, γ_{50}	0.2127*** (0.038)	-1.1508** (0.3910)	8981
For STRAT6 slope, β_6			
INTRCPT2, γ_{60}	0.2863*** (0.0422)	-2.1763** (0.3956)	8981
For STRAT7 slope, β_7			
INTRCPT2, γ_{70}	0.3249*** (0.0429)	-1.7545*** (0.3993)	8981
For STRAT8 slope, β_8			
INTRCPT2, γ_{80}	0.3383*** (0.0465)	-2.1684*** (0.4061)	8981
For STRAT9 slope, β_9			
INTRCPT2, γ_{90}	0.4313*** (0.0475)	-1.4848*** (0.4112)	8981
For STRAT10 slope, β_{10}			
INTRCPT2, γ_{100}	0.5883*** (0.0463)	-3.0518*** (0.4192)	8981

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Final estimation of variance components(For Model1 Cognitive Score)

Random Effect	Standard Deviation	Variance Component	*d.f.*	χ^2	*p*-value
INTRCPT1, u_0	0.3952	0.1562	109	858.8517	<0.001
PARTCP2 slope, u_1	0.1737	0.0301	109	192.2023	<0.001
level-1, *r*	0.6922	0.4791			

Final estimation of variance components(for Model2 Adverse Psychological Score)

Random Effect	Standard Deviation	Variance Component	*d.f.*	χ^2	*p*-value

INTRCPT1, u_0	1.32198	1.74763	109	186.63517	<0.001
PARTCP2 slope, u_1	0.85531	0.73156	109	143.48002	0.015
level-1, r	7.89674	62.35851			

In Model1, $\beta_1 = 0.0548$ indicated a positive effect of parental participation on students' cognitive ability scores ($p<0.05$). Parent's participation versus non-participation results in a 0.0548 increase in student's' scores, controlling for the contextual effects of school. To get a standardized effect size, this study used the Cohen's d to calculate. Dividing the increase in score by its standard deviation, the effect size is 0.076, which indicated a relatively small effect size(<0.2).

u_0 showed a statistically-significant variance between schools in their average cognitive scores($p<0.001$). u_1, the random effect for the slope of parental participation also showed a statistically significant variance between schools($p<0.05$). The result indicates that parental participation brings educational benefits to students, and the effect varies across school. Based on the estimation of variance components, the 95% plausible value interval for intercept u_0 is (-0.0435 to 0.0149). This means that with 95% confidence the mean cognitive score school j is between -0.0435 and 0.0149 for those students whose parents did not attend the meeting. The 95% plausible value interval for slope u_1 is (0.0492 to 0.0604), and this means that with 95% confidence the treatment effect lies between 0.0492 and 0.0604 for the students whose parents attended the meeting.

In Model2, the results for β_1 showed a negative effect of parental participation on students' adverse psychological well-being($p<0.001$). Parent's participation versus non-participation results in a 0.4917 decrease in the score measuring the adverse psychological states($p<0.05$), controlling for the contextual effects of school. Since the outcome variable measures how often students experience negative psychological

states, a higher outcome score represent an adverse psychological state. Therefore, the negative coefficient indicates a positive influence on students' mental health.

u_1, the random effect for the slope of parental participation also showed a significant variance between schools($p<0.05$). The result indicates that parental participation brings psychological benefits to students, and the effect varies across school. Based on the estimation of variance components, the 95% plausible value interval for intercept u0 is (23.3 to 23.9), and the 95% plausible value interval for slope u1 is (-0.609 to -0.335). This means that with 95% confidence the mean adverse psychological scores lie between 23.3 to 23.9, for students whose parents did not attend the meeting. And with 95% confidence the treatment effect is between -0.609 to -0.335 for students whose parents attended the meeting.

4.5 Moderation effect of school-level factors

Based on the basic hierarchical linear model, this study then explored the school-level characteristics that may moderate the treatment effect. I am planning to test the moderation effect of school location, school's policy, average parental education level and average parental income level. The model is shown below:

Level-1 Model

$$COGNITIVE\ SCORE2_{ij} = \beta_{0j} + \beta_{1j}*(PARTICIPATION2_{ij}) + \beta_{2j}*(STRAT2_{ij}) + \beta_{3j}*(STRAT3_{ij}) + \beta_{4j}*(STRAT4_{ij}) + \beta_{5j}*(STRAT5_{ij}) + \beta_{6j}*(STRAT6_{ij}) + \beta_{7j}*(STRAT7_{ij}) + \beta_{8j}*(STRAT8_{ij}) + \beta_{9j}*(STRAT9_{ij}) + \beta_{10j}*(STRAT10_{ij}) + r_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(RURAL_j) + \gamma_{02}*(PARENTAL\ EDUCATION_j) + \gamma_{03}*(\text{PARENTAL INCOME}_j) + \gamma_{04}*(POLICY_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}*(RURAL_j) + \gamma_{12}*(PARENTAL\ EDUCATION_j) + \gamma_{13}*(\text{PARENTAL INCOME}_j) + + \gamma_{14}*(POLICY_j) + u_{1j}$$

$RURAL_j$ = Location of school j, where rural is 1 and urban is 0

$PARENTAL\ EDUCATION_j$ = Average parental educational level of school j, where below average is 1 and at or above average are 0

$PARENTL\ INCOME_j$ = Average parental income level of school j, where below average is 1 and at or above average are 0

$POLICY_j$ = School policy on parental involvement of school j where a high-level involvement policy is 1 and a low-level involvement policy is 0

β_{0j} = Estimated cognitive score for students whose parents did not attend the meeting at school *j*

γ_{00} = Estimated cognitive score for students whose parents did not attend the meeting at schools that are in rural area, have a lower-than-average parental SES and a high level of involvement policy.

β_{1j} = Difference in cognitive score for students whose parents attend the parent meeting at school *j* (Estimated effect of parental participation for students at school *j*)

γ_{10} = Estimated treatment effect of parental participation averaged across schools located in rural area, with lower-SES parents and a high-level policy

γ_{01} ... γ_{03} = Difference in cognitive score between rural and urban school, school with higher-SES parents and lower-SES parents, and school with high-level policy and low-level policy, respectively

γ_{11} … γ_{14} = Difference in the treatment effect between rural and urban schools, school with higher-SES parents and lower-SES parents, and school with high-level policy and low-level policy, respectively

To investigate the psychological outcomes, this study uses students' self-reported psychological well-being as the outcome variable. The other parts of the model remain unchanged. The results for the two models are shown below in Table5.

Table5 *Moderation effect of school-level factors*

Fixed Effect	Model 1A Coefficient	Model 2A Coefficient	Approx. *d.f.*
For INTRCPT1, β_0			
INTRCPT2, γ_{00}	-0.0096 (0.0842)	24.5889*** (0.1538)	107
RURAL, γ_{01}	-0.0743 (0.0858)	-1.1156** (0.3646)	107
AVERAGE PARENTAL EDUCATION LOW, γ_{02}	-0.3659*** (0.1175)	0.5534 (0.6567)	107
AVERAGE PARENTAL INCOME LOW, γ_{03}	0.1275 (0.1191)	-0.9994 (0.4064)	107
POLICY HIGH, γ_{04}	0.2120 ** (0.0822)	-0.3101 (0.3666)	107
For PARTICIPATION slope, β_1			
INTRCPT2, γ_{10}	0.1178** (0.0566)	-1.2314*** (0.4547)	107
RURALSH, γ_{11}	-0.0980 (0.0526)	0.9663* (0.5091)	107
AVERAGE PARENTAL EDUCATION LOW, γ_{12}	0.1566* (0.0854)	-0.8863 (0.6790)	107
AVERAGE PARENTAL INCOME LOW, γ_{13}	-0.0926 (0.0824)	1.3967** (0.6617)	107
POLICY HIGH, γ_{14}	-0.0630 (0.0532)	0.0865 (0.4958)	107

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(The coefficients for the stratum are not displayed in this table. Please find the full table in the appendix.)

In Model1A, γ_{10} =0.1178 showed a positive treatment effect of parental participation averaged across schools located in rural area, with lower-SES parents and a high-level policy(p<0. 05). Compared to treatment effect in Model1(γ_{10} =0.0548), the effect of parental participation in Model1A increased, after taking account into the effect of school's location, average parental SES and school policy. Such increase indicates that at lower-SES(versus high-SES) schools located in

rural(versus urban) area, parental participation brings more educational benefits to students. Based on Cohen's d, a 0.1178 increase in cognitive score represents a standard effect size of 0.1485.

According to the coefficients on the slope, $\gamma_{12} = 0.1566$ indicated a positive moderating effect of parental education that is lower than average($p<0.1$). At schools with less-educated parents, the increase in scores from parental participation is 0.1566 higher compared with schools with higher-educated parents. The effect is significant at the 0.1 level.

As for the psychological outcomes, rural versus urban school has a lower scores measuring negative psychological well-being. Since the psychological outcome is a score measuring how often students experience adverse psychological states, the higher the score, the less benefits on students' psychological states. Therefore, the coefficients for the slope $\gamma_{13} = 1.3967$ indicated a negative moderating effect of parental income level that is below average($p<0.05$). At schools with less wealthy parents, the psychological benefit from parental participation is 1.3967 lower than schools with more wealthier parents. Other school-level factors including school policy do moderate the effect of parental participation on students' psychological well-being.

Overall speaking, school policy and school location do not have an influence on the treatment effect. Parental participation do not bring more academic benefits to students at advantaged schools. Instead, students at schools with less-educated parents could gain a larger increase in sores from parental participation, compared with students at a school with higher-educated parents.

4.6 Moderation effect of individual-level factors

One of the aims of the study is to examine whether parental school involvement perpetuates educational inequality by having added rewards for the advantaged students. To provide answer to this question, this part investigates how the effect of parental participation varies by students' family background and pre-test score. This part examines the moderation effect of a range of individual-level factors, including mother's education, father's occupation type, family financial condition, students'cognitive score in wave 1, and students' hukou status.

The model is shown below:

Level-1 Model

$$COGNITIVE\ SCORE_{ij} = \beta_{0j} + \beta_{1j}*(PARTICIPATION_{ij}) +$$

$$\beta_{2j}*(PARTICIPATION*PRE\text{-}TEST\ SCORE_{ij}) + \beta_{3j}*(PRE\_TEST\ SCORE_{ij}) +$$

$$\beta_{4j}*(STRATA1_{ij}) + \beta_{5j}*(STRATA2_{ij}) + \beta_{6j}*(STRATA3_{ij}) + \beta_{7j}*(STRATA4_{ij}) +$$

$$\beta_{8j}*(STRATA5_{ij}) + \beta_{9j}*(STRATA6_{ij}) + \beta_{10j}*(STRATA7_{ij}) + \beta_{11j}*(STRATA8_{ij}) +$$

$$\beta_{12j}*(STRATA9_{ij}) + \beta_{13j}*(STRATA10_{ij}) + r_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + u_{2j}$$

$$\beta_{3j} = \gamma_{30} + u_{3j}$$

$PARTICIPATION*PRE\_TEST\ SCORE_{ij}$ = Interaction term of participation and students' wave1 cognitive of student i in school j

In addition to pre-test score, this study tested the interaction effect between parental participation and other individual-level factors, including father's occupation type(elite vs. non-elite), mother's education, family financial condition and students' household registration status. To test the moderation effect of these factors, the same

model is applied. The interaction term is replaced with the corresponding one and other parts of the model remained unchanged.

4.6.1 The moderating effect of Pre-test score

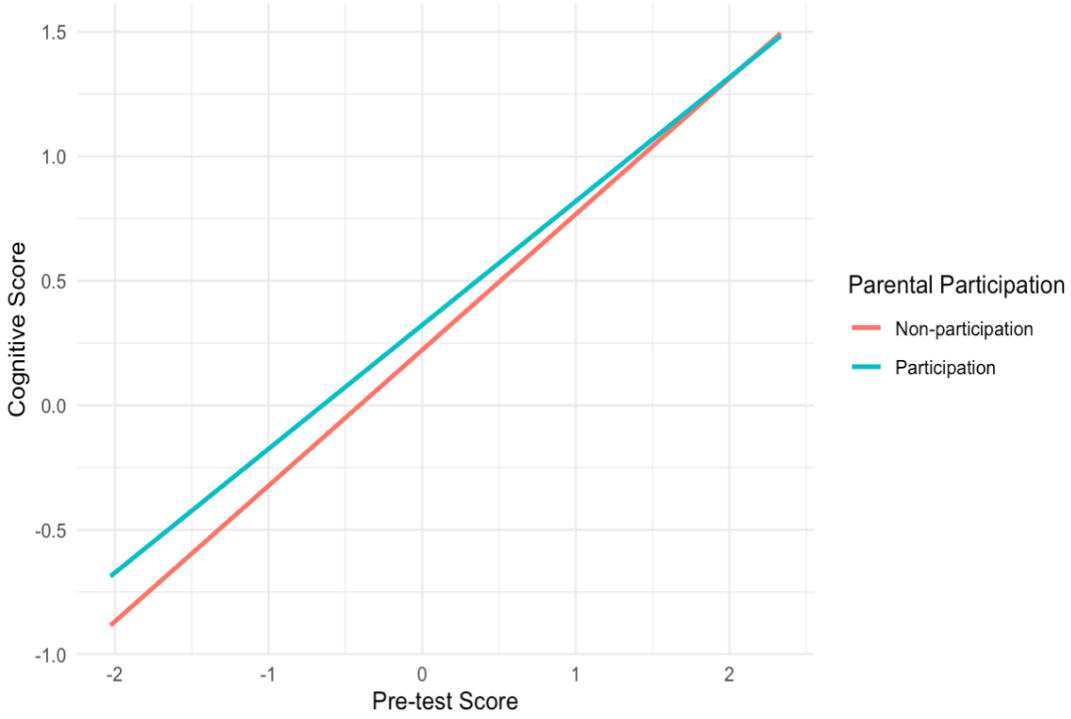
Table 6 *The Moderation Effect of Pre-test Score on Cognitive Score*

Fixed Effect	Coefficient	Standard error	Approx. *d.f.*
For INTRCPT1, β_0			
INTRCPT2, γ_{00}	0.2216***	0.0411	111
For PARTICIPATION slope, β_1			
INTRCPT2, γ_{10}	0.0596***	0.0204	111
For PARTICIPATION * PRE_TEST SCORE slope, β_2			
INTRCPT2, γ_{20}	-0.0542**	0.0218	111
For PRE_TEST SCORE slope, $\beta 3$			
INTRCPT2, γ_{30}	0.4657***	0.0214	111

*** p<0.01, ** p<0.05, * p<0.1

(The coefficients for each of the stratum are not displayed in this table. Please find the complete table in the appendix.)

Graph2 *The Interaction Effect Between Pre-test Score and Parental Participation on Students' Cognitive Score*



In Table 6, γ_{20} = - 0.0542 showed a negative interaction effect between parental participation and pre-test score($p<0.05$). While pre-test score positively predicted cognitive scores($p<0.001$), with one unit increase in pre-test score, the effect of parental participation decreased by 0.0542. Graph 2 showed a decreasing treatment effect as pre-test score increases. As students' pre-test score increased, the difference in academic achievement between parental participating and non-participating groups decreased, shown as the decreasing vertical distance between the blue line(participation) above and red line(non-participation) below. The results indicated that compared to high-achieving students, parental participation could bring more academic benefits to students with a lower pre-test achievement.

4.6.2 The moderating effect of father's occupation

Table 7 *The Moderation Effect of Father's Occupation Type(Elite vs. Non-elite) on Cognitive Scores*

Fixed Effect	Coefficient	Standard error	Approx. *d.f.*
For INTRCPT1, β_0 INTRCPT2, γ_{00}	-0.0157	0.0524	111

For PARTICIPATION slope, β_1			
INTRCPT2, γ_{10}	0.0674**	0.0276	111
For PARTICIPATION * FA OCCUPATION ELITE slope, β_2			
INTRCPT2, γ_{20}	-0.0923*	0.0480	111
For FA OCCUPATION ELITE slope, $\beta 3$			
INTRCPT2, γ_{30}	0.0546	0.0462	111

*** p<0.01, ** p<0.05, * p<0.1

Graph3 *The Interaction Effect Between Father's Occupation Type and Parental Participation on Students' Cognitive Score*

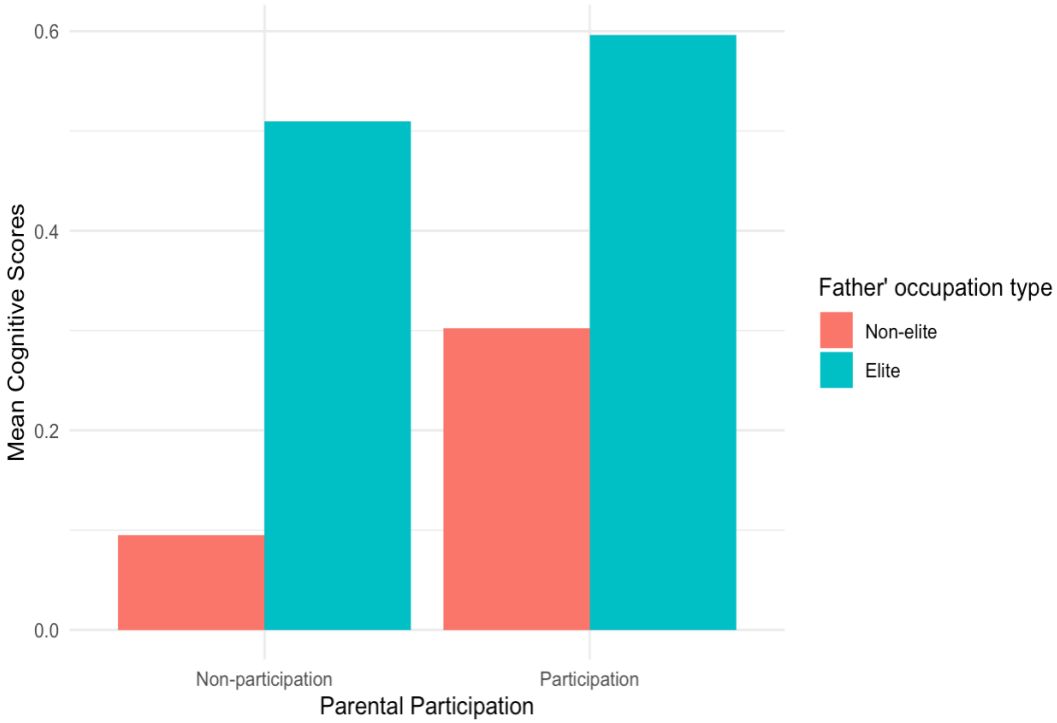


Table 7 presented the moderation effect of father's occupation type(elite vs. non-elite). γ_{20} = -0.0923 indicated a negative effect of an elite versus non-elite occupation type($p<0.1$). For students whose father has an elite job, the increase in score from parental participation is 0.0923 lower than student whose father has a non-elite job. However, the moderating effect of father's occupation is less significant($p=0.057$) than the moderating effect of pre-test score($p=0.018$). Graph 3 displayed the interaction effect between father's occupation and parental participation. The bar plot shows the difference in cognitive score between control(non-

participating) and treated(participating) groups, represented by the difference in height between the bar on the right and the bar on the left. The increase in height for the blue bars is larger than the increase in height for the red bars, suggesting that parental participation has a larger effect on students whose father has a non-elite occupation.

Overall, by exploring the moderating influence of individual factors, the results indicated that parental participation at least does not perpetuate educational inequality by having added rewards for the advantaged students who are from higher-SES families. Mother's education, family financial condition and hukou status does not moderate the effect. The results for these variables are included in the appendix. Moreover, in align with several studies (Dearing 2004; 2006; Hill & Taylor 2013), the results found that disadvantaged students may benefit more from parental participation. Parental participation has a larger positive results for students with a lower cognitive score in wave 1, compared with students with a higher pre-test score. Additionally, significant at $p<0.1$ level, parental participation has a larger positive effect for students whose father has a non-elite occupation, compared with students whose father has an elite occupation.

5. Discussion

The results indicated that parental participation in school-meeting does bring academic and psychological benefits to the adolescents in China. This finding is consistent with the existing research and theories on the positive impact on academic achievement of parental school involvement (Epstein 1991; Comer 1995; Lareau 1996; Hill & Craft 2003; Zhang 2011; Sheridan et al., 2017). To add to our understanding of a less-explored developmental stage, this study focused on the adolescents in China and investigated the effect on psychological well-being. On one hand, the positive

effect on psychological outcomes confirms the psychological benefits of participation in parent-school meeting, alleviating concerns about the negative effects of authoritarian and intrusive parental involvement(Wang & Cai, 2017). On the other hand, the small-size effect on academic achievement and psychological well-being highlights the necessity of taking account into the changes and unique dynamics associated with adolescents' s development, in order to promote a developmentally appropriate and effective parental involvement(Hill & Tyson 2004, Hill & Taylor 2009).

More specifically, the positive effect of parent-school meeting indicates the non-intrusive and supportive nature of parent-school meetings in China, which is rooted in the cultural norms and expectation on parental involvement in education(Ji & Koblinsky 2009). Indeed, parent-school meetings in China have long played a significant role in the educational system and are considered an essential component of the parent-school cooperation. These meetings are formal gatherings where parents and teachers come together to discuss students' academic progress, behavior, and overall well-being. In China, parent-school meetings are typically held regularly throughout the academic year and have become an established norm in the education system. Students and parents are accustomed to the routine of these meetings, and it is widely understood that attending them is a natural part of being involved in a child's education(Ji & Koblinsky 2009). Therefore, instead of seeing it as intrusive, adolescents could be more receptive to these meetings and perceive them as supportive and beneficial to their academic and personal growth.

While school-based involvement has a positive impact on adolescents' academic and psychological outcomes, the effect size is relatively small. This result aligns with previous studies that observed diminishing effects of school-based

involvement in middle-school compared to kindergarten or elementary-school(Hill & Taylor, 2009; Swider, 2014; Boonk, 2018; Barger et al., 2019). Together with these findings, the evidence of this study highlights the need to consider the characteristics of early adolescent development and unique family dynamics during adolescence.

Indeed, during adolescence, parent-adolescent relationships undergo a transformation, becoming less hierarchical and characterized by increased bidirectional communication(Collins & Lareau, 2004; Steinberg & Silk, 2002). Studies have outlined that there is a shift in roles and expectations as adolescents challenge parental authority, while parents aim to establish boundaries and encourage healthy independence(Grolnick et al., 2007; Smetana et al., 2004). Moreover, cognitive development enables adolescents to play a more active role in their education. Therefore, parental involvement often becomes more indirect and strategies for involvement should adapt accordingly. Hill & Taylor's(2009) meta-analysis study found that compared to school-based involvement, academic socialization has a stronger positive relation with achievement. The small effect size in the present study adds to the existing evidence on the variation in effect size between different types of involvement, suggesting that parental involvement that promotes socialization around the goals and purposes of education, and that provides adolescents with useful strategies might be more effective than more direct parental involvement.

Additionally, the finding on factors predicting parental participation supports to some extent the critical perspective on the disparity in parental participation(Lareau, 2003; Fergusson et al., 2008; McLanahan & Percheski, 2008; Kwan & Wong, 2016; Calarco 2018). The results show that advantaged versus disadvantaged parents are more likely to attend the meeting. For instance, mother's education positively predicts

parental participation--the likelihood increases as mother's education level increases. Such findings highlight the barriers for the disadvantaged parents, adding to the evidence on the unequal access to parental participation(Kwan & Wong, 2016; Calarco 2018). Specifically, the results indicated that lower-SES parents might encounter a range of challenges such as limited resources, time constraints, language barriers, and lack of familiarity with the education system(Fergusson et al., 2008; McLanahan & Percheski 2008).

However, the results contradict previous research that reported an added rewards for the advantaged students. On the contrary, the evidence of the present study showed benefits of parental participation for disadvantaged students. Overall, these findings are in accord with previous research(Dearing et al., 2004; 2006; Jeynes, 2005; Boonk et al., 2018; Barger 2019), implying that the students who would benefit most from parental involvement are those who are least likely to receive it, unless proactive effort is made by the school or programs. Future studies can examine the specific barriers for these disadvantaged families, to help identify strategies to increase participation.

One limitation of the present study is the potential endogeneity problem of parental participation. In order to alleviate this problem, this study chooses school meeting as the independent variable because it is a regularly-held, school-initiated activity. Studies have found that parents tend to be involved in schooling when their children are having trouble at school(Hill & Taylor, 2004). A regularly held, school-wide activity can therefore reduce such endogeneity problems to some extent. However, literature also shows that wealthier schools are more likely to involve parents in schooling. Therefore, this study would benefit from taking account into the effect of school policy. The present study examines the effect of stimulated

participation without considering the school-level factors that may influence school policy on parental involvement, which can in turn influence parental participation.

Finally, this study uses a dummy variable to measure parental participation, testing the treatment effect at the expense of neglecting the multi-dimensional nature of parental participation. Parental involvement in a child's education is a complex and multifaceted concept that can manifest in various ways. It encompasses not only the presence or absence of participation but also the frequency, quality, and diverse types of parent-school cooperation(Fan and Chen 2001). In summary, future research can adopt a more comprehensive approach by considering the multi-dimensional nature of parental participation, exploring the impact of involvement at different developmental stages, and exploring in detail the barriers faced by disadvantaged families.

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