

DO CHINESE STUDENTS BENEFIT FROM “SCHOOL CHOICE” AT THE
STAGE OF COMPULSORY EDUCATION?

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By

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ABSTRACT

Since the 1990s, school choice has become a common phenomenon in China. Parents choose schools for their kids through various channels: spending money, abusing power for privilege, or purchasing houses in specific educational districts. These practices, however, are not only unrecognized by the Chinese government, but they also violate the *Compulsory Education Law of the People's Republic of China*. Legally, each school-age student must attend a school in his/her districts determined by the principle of proximity-based admission. Existing work on school choice in China has provided valuable insight into the factors behind the exercise of school choice and its adverse effects on Chinese society. Basically, Chinese families' school choice practices are strongly correlated with their economic, social and political capital. Socially, school choice has led to inequality in education. Prior studies generally have not reflected the short-term effects of school choice on students themselves. I hypothesize that school choice improves students' academic achievement but has a negative impact on students' *short-term* well-being. My research contributes to the current study by evaluating whether Chinese students at the stage of compulsory education benefit from school choice as parents expect. Using data from the *China Education Panel Survey*, I find results that are not exactly consistent with my original hypotheses. School choice does negatively impact students' short-term well-being, and it is also negatively correlated with students' academic achievement. The results imply that parents should not be too optimistic about the impact of school choice. Not only do their children fare worse academically, but they

also tend to be less happy than their peers. Policymakers should address the conflicts between equality and educational quality in making future decisions on school choice phenomenon.

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INTRODUCTION

The study of school choice phenomenon in China can be dated to the 1990s when the economy developed rapidly, and Chinese parents started to pay more attention to their children's education. Research has already revealed the causes and influences of school choice in China at both the macro and micro levels. Fundamentally, the conflict between the people's growing need for quality education and the unbalanced distribution of educational resources has triggered the school choice practices (Dong & Li, 2019). Also, the belief that "don't let your children lose at the starting line" has driven Chinese parents to overcome all the odds and provide their children with better education (Tsang, 2000). While the benefit of school choice on students' academic performance remains unclear, the phenomenon has resulted in even severe inequality in education (Wu, 2010).

This thesis aims to illuminate the effect of school choice on students' school life. Specifically, I seek to determine whether the Chinese students at the stage of compulsory education benefit from school choice academically as their parents expected, as well as their short-term well-being with regard to school choice. The analysis is based on 10,520 individual-level observations of a nationally representative tracking survey, the *China Education Panel Survey* (CEPS), which provides ample information about students' school records, physical and psychological health conditions, and their families. Using basic OLS and probit models, and different quasi-experimental methods (difference-in-differences and a treatment-effect model), I find that not only the students who chose school fare no better academically than their peers, they also tend to be less happy.

This thesis is structured as follows. The background section provides the context for this research, which includes the enrollment policy of China's compulsory education system as well as the origins and governance of school choice. Following is the literature review section that

summarizes the existing international and Chinese studies on the effect of school choice. The next section discusses the conceptual and empirical framework underpinning my hypotheses and the choice of models used to examine the effect of school choice on students' academic achievement and short-term well-being. The data description section describes the dataset I used for my study and provides the descriptive statistics of dependent and control variables. The following section provides the empirical analysis of the relationship between school choice and students' academic performance and happiness based on the models I choose. The last section synthesizes the conclusion I draw from the previous section and discusses the policy implications of my findings.

BACKGROUND

School choice in China, like in western countries, is characterized by the abuse of economic, social, and political capital. What makes the story of school choice different in China is that it is not lawful. Compulsory education enrollment in China is mainly based on the principle of proximity-based admission, while school choice still exists as an acquiescent choice. Both of them have been complementary to each other and coexist for decades in Chinese education system.

The main idea of proximity-based admission policy is that public schools are divided into different school districts, and school-age children should go to the nearby public schools in their districts of residence (Tsang, 2000). The policy was designed to protect the educational equality and can be found in written laws and regulations since 1980. In the *Decision on several problems of universal primary education* issued in 1980, the Chinese central government proposed that local government should “strive to accommodate the school distribution and the education to production and life of the masses so that students can go to schools nearby.” The *Compulsory Education Law of the People's Republic of China* promulgated in 1986 officially incorporated the proximity-based admissions policy. Article 12 of the *Compulsory Education Law* stipulates: "Local governments at various levels shall ensure that all school-age children and adolescents are enrolled in schools in the districts where their residences are registered." The revised *Compulsory Education Law* enacted in 2006 further emphasized that all the school-age children and adolescents shall enroll in schools according to the principle of test-free and proximity-based admission. Thus, official law in China denies the legitimacy of school choice (Wu, 2013).

In reality, however, school choice is prevalent in the Chinese compulsory education, driven mainly by the inequality of educational resources distribution. During the 1950s – 1960s, the government advocates the construction of key schools, resulting in a wide educational quality gap

between schools and an imbalance of educational resources, which foreshadowed the emergence of school choice (Zhang, 2019). The Key school construction is the product of a specific historical period. When the People's Republic of China was founded in 1949, the educational resources of the country were extremely scarce and dispersed. In order to cultivate high-quality talents with minimal cost, the central government adopted the educational development policy of concentrating the limited resource to construct key schools nationwide. In 1953, the Ministry of Education required all provinces and municipalities to select key middle schools and put more effort into constructing the selected schools so that they can gradually improve the quality of middle-school-education throughout the entire country. In 1962, this policy was extended to primary schools. By the end of 1963, 487 (3.1%) of the public middle schools and 3,071 (7%) of the public primary schools are selected key schools (Tan & Wang, 2016; 2010).

With the preference of quality education rooted in the Chinese culture and the rapid economic development, people's demand for quality education continuously increased (Tsang, 2000). Since the 1990s, school choice has inevitably become a prominent issue because of the gap between supply and demand (Dong & Li, 2019). Because of its' unique economic, political and cultural characteristics, Chinese school choice experience is quite different from that of western countries (Wu, 2013). In China, "school choice" is generally an educational phenomenon that forms spontaneously, which is "bottom-up" rather than "top-down." Without an officially recognized pathway, parents usually choose schools for their children in informal or illegal ways by spending money (i.e., school choice fee, sponsor fee), abusing power for privilege or purchasing house in the dream school's district (Dong & Li, 2019).

It did not take long for the Chinese government to take actions against those illegal practices. The policies on school choice has gradually shifted from prohibition of school choice fees to

improvement of educational equalization. In *1996 notice concerning the implementation opinion on governing unreasonable fees in primary and secondary schools*, the State Council of China officially included the problem of school choice into policy agenda. The *Notice* explicitly stated that public primary and secondary schools under the compulsory education are not allowed to enroll the students who engaged in school choice, and the unreasonably high fees related to school choice must be prohibited. In 2012, the Ministry of Education (MOE), the National Development and Reform Commission (NDRC), and the National Audit Bureau issued the "*Eight Measures for the School Choice Charges in the Compulsory Education Stage*", strictly regulating the school fees and set standard for various forms of fees. Policies are not only focusing on governing the choice fees. Recent official documents have also focused on dealing with other potential costs related to school choice. For example, The third section in the "*Notice on Accomplishing Enrollment for Compulsory Education in 2017*" emphasized that "In areas where the allocation of educational resources is not balanced, the impulse of the masses to choose schools is strong, and the problem of 'school districts house' is prominent, the local governments must vigorously promote the balanced development of education and steadily push forward proximity-based admissions."

In the past decade, the Chinese government has been increasingly aware of the root cause of school choice, which is the quality gap between different schools. The goal of educational equalization, therefore, has been incorporated in the policy framework for school choice governance. *The National Medium- and Long-Term Education Reform and Development Plan (2010–2020)* issued by the MOE in 2010 proposed ten policies that aiming to govern school choice by reducing the gap, which include "standardize proximity-based admission system," "balance educational resource allocation," "improve the infrastructure and educators' quality of lower-performing schools," and so on.

A governance system builds on the core principle of proximity-based admission, the basic method of school district division, and the auxiliary means of reallocate educational resources has been gradually established (Zhang, 2019). The Chinese government's attitude toward school choice remains ambiguous, however, as it enacts a variety of "guidelines" and "plans" to govern practices while turning a blind eye to the pervasive exercising of choice (Dong & Li, 2019). Thus, the phenomenon of school choice has not been completely eliminated, but has been transformed into an "undercurrent" surging in the compulsory education enrollment process.

LITERATURE REVIEW

Policy concern about school choice has become a global issue. So far, countries in different continents have implemented educational policies that expand students' choice of schools at different levels (Plank & Sykes, 2003). The controversies on school choice policies, however, have never been settled since 1955, when Milton Friedman discussed the alternative interventions that the government should take in education.

School choice primarily refers to providing individuals with alternatives to traditional public schools, which gives school-age children and their families greater freedom to choose the school they prefer (Friedman, 1955). The supporters of school choice policies argue that free choice in education under the market mechanism of competition and school autonomy is the most efficient system to deliver quality education (Chubb & Moe, 2011). While the opponents hold the point that the current decentralization and school choice policies are unlikely to bring benefits to the disadvantaged groups as the supporters advertised. To fight for broader educational justice, governments must go beyond decentralization and school choice (Whitty, Power, & Halpin, 1998).

Most global studies sprout euphoric towards the impacts of school, arguing that students in private or charter schools usually show higher educational gains than those in public schools *due to* the better school atmosphere (Dronkers & Robert, 2008). Also, the increasing competition between private schools and public schools driven by school choice policies can positively affect the educational achievement of students, because it seems that more competition gives rise to higher productivity in school systems (West & Woessmann, 2009). Several studies estimate the achievement effect of charter schools and provide evidence that embraces the positive association between school choice and student achievement. For instance, studies show the charter schools in

Chicago (Hoxby & Rockoff, 2005), New York City (Hoxby & Murarka, 2009) and Boston (Abdulkadiroğlu et al., 2011) increased the student achievement remarkably.

Other evidence also indicates that the academic benefits of school choice are not uniformly positive. In Chicago, the “winners” in the school choice process, who are supposed to have higher achievement given to their access to better educational resources, performed no better than their counterparts (Cullen, Jacob, & Levitt, 2006). Another study developed by the Public Policy Institute of California in the same year also revealed the fact that school choice cannot improve students’ academic performance as the supporters hoped to. Researchers who evaluated the voucher plans in New York City (Mayer, et al., 2002) and Washington D.C. (Wolf, et al., 2007; 2010) also found a very small positive effect on students’ test scores. Similar results can also be found in studies focused on the school choice systems of other countries, such as Sweden (Carnoy, 1998) and Chile (Hsieh & Urquiola, 2006). Some recent findings in Louisiana and Indiana even found achievement loss correlated with school choice programs (Abdulkadiroğlu, Pathak, & Walters, 2018; Waddington & Berends, 2018). Together, these studies find the effect on student achievement is entirely ambiguous, and can be zero, positive or negative.

Even if the achievement effect is positive, evidence shows that the academic gains correlated with school choice do not improve students’ satisfaction with school and psychological well-being (Saminathen, Låftman, & Modin, 2019).

In China, “School Choice” usually refers to the acts of giving up the existing educational arrangements of the government and choosing other schools. The “choice” has different meanings under different dimensions (Wen, 2008): regarding the school system, families can choose schools within the public school system and private schools outside the system; regarding the region, families can choose a school within the counties, cities, and districts they registered in or choose

cross-regional schools; regarding the educational organization, families can choose schools between regular and non-conventional educational institutions (i.e., participating in tutoring classes, home-schooling, etc.).

Scholars have focused their research on two main aspects. On the one hand, the studies are interested in figuring out how family background influences the school choice behaviors. For example, Li (2008), using the data of households' education-related expenditure in 18 cities, found that the families' socioeconomic status has a strong positive correlation with the ranking of their children's school; Based on 2003 CGSS data, Zhou and Lu's empirical study (2009) shows that family income, parents' social capital, and political capital jointly increase the probability of school choice; Using the same data as Zhou and Lu, Ye and Li (2018) found that parents' political capital significantly increased the probability of school choice, and higher political capital can reduce their school choice expenses. On the other hand, the studies reveal the negative effect of school choice on Chinese society. Through the investigation of the ability of families in different social classes to choose high-ranking schools, and a variety of school choice policies and charging standards, Wu (2010) found that school choice has led to the inequality of educational resources distribution. Surprisingly, school choice is still supported by the majority of the population, including the disadvantaged groups who have suffered significant losses from it.

Also, a China-based study implied that nearly half of the middle school students who engaged in school choice feel anxiety and inferior occasionally because of the difficulty in getting high scores and the pressure from their parents and peers (Li, Yu, & Wang, 2011).

In sum, limited studies have explored the effect of school choice on students themselves. This research examines the correlation between school choice and students' achievement at the individual level, as well as the correlation between school choice and students' short-term well-

being in China. Based on the existing studies, school choice is expected to have a positive effect on students' academic performance and negative effects on students' short-term well-being.

THEORETICAL FRAMEWORK

Conceptual Framework

My first hypothesis is that school choice has a positive impact on Chinese students' academic achievement at the stage of compulsory education. The theoretical basis of this hypothesis derives from the studies of choice advocates, which argued that school choice could not only boost the quality of education through competition but also promote better matches between students and schools (Friedman 1955; Hoxby 2003). Empirical studies generally find a positive effect of school choice on students' academic achievement, especially at schools where demand exceeds capacity (Hoxby & Rockoff, 2005; Hoxby & Murarka, 2009; Abdulkadiroglu et al., 2011). Although some research may indicate the positive impact of school choice is not as significant as proponents expected (Mayer et al. 2002; Cullen et al. 2006; Wolf et al. 2007, 2010), a negative impact of school choice is rarely found. Since Chinese parents tend to choose popular schools with quality educational resources, we should expect students to perform better if they exercise choice.

My second hypothesis is that school choice has a negative correlation with students' *short-term* well-being, in large part due to the disruption caused by the move. In the past decades, the debate on whether alternatives to public school are better choices for students mainly focused on examining the difference in educational attainment which can be a strong predictor for "success" in later life including employment (Currie & Thomas, 2001), wages (Card & Krueger, 1992), and long-term well-being (Hanushek, 2004). The impact of school choice on individuals' short-term welfare should also be noticed. According to Green's study (2014), school choice does not necessarily improve or even reduced students' well-being based on their satisfaction with school education. Based on the studies focusing on the association between school choice and students' short-term well-being in both United States (Saminathen, Låftman, & Modin, 2019) and China (Li,

Yu, & Wang, 2011), I hypothesize that school choice will have a negative effect on student's short-term well-being in China's compulsory education. This impact will affect student performance and dampen the "true" or long-term effect of school choice.

In fact, one can infer from the existing literature that the negative effect on students' short-term well-being will exceed the positive effect on students' academic achievement. Such a finding would imply that although a high-quality learning environment plays an important role in the students' development, parents should cautiously consider students' feelings and avoid exercise choice blindly.

Empirical Framework

Building on the background introduction and hypotheses, the conceptual framework is illustrated in Figure 1 below:

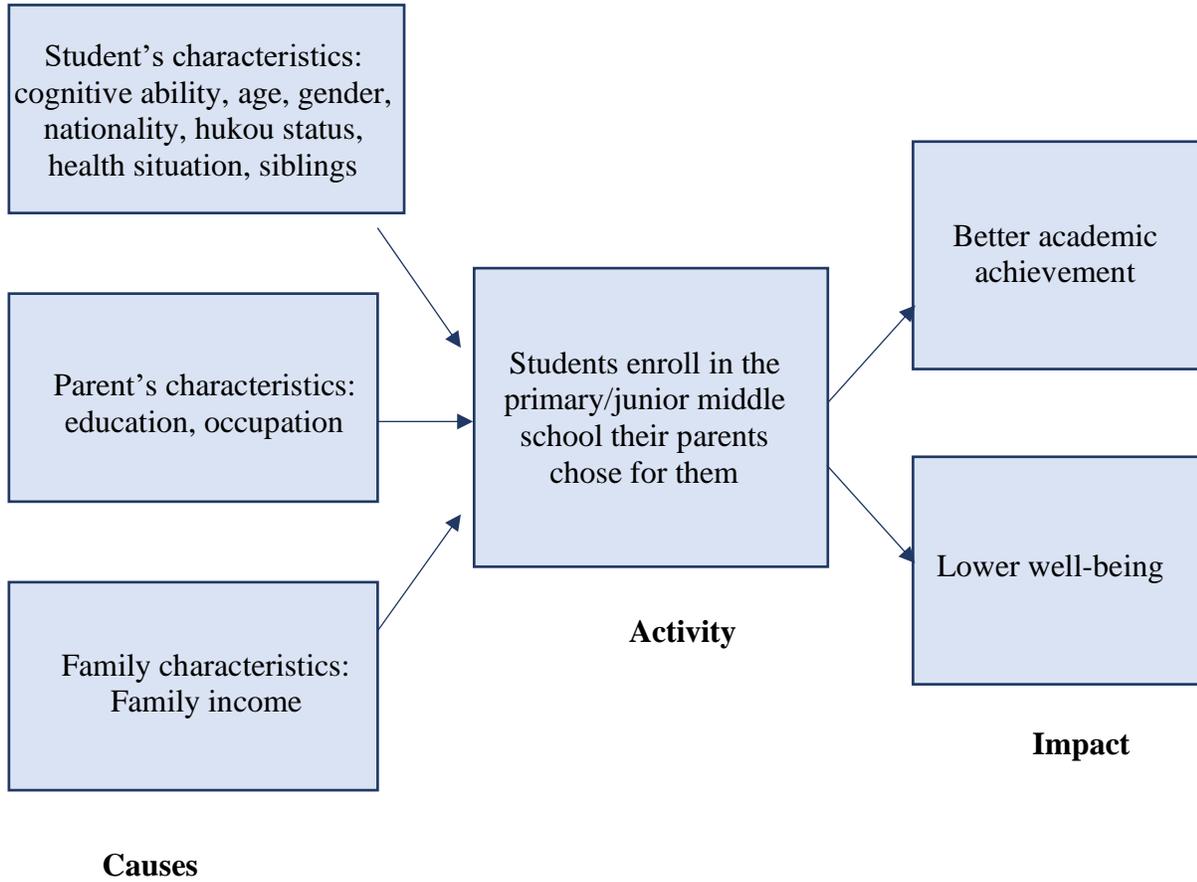


Figure 1. School Choice in China: Empirical Framework

Basic Specification

To empirically examine the impact of school choice on student's academic achievement and well-being, I use OLS and probit model. The baseline model can be written such that:

$$Y^* = \alpha_0 + \beta * SchoolChoice_i + \delta_1 * X_i^S + \delta_2 * X_i^P + \delta_3 * X_i^F + \varepsilon_i \quad (1)$$

The dependent variable Y^* measures the academic achievement or short-term well-being of students. Whether students engaged in school choice practices is the core explanatory variable. The dataset used for this research is the *China Education Panel Survey* (CEPS). Test scores of main courses provided by schools serve as unbiased measures of academic achievement. The actual Y^* for student's well-being is unobserved in the dataset I use. Rather, I use five indicators of students' self-reported short-term negative emotions (includes the degree of feeling blue, depressed, unhappy, not enjoying life and sad) as measures of happiness. Studies show that there is a negative correlation between happiness and negative emotions. Generally, happier people tend to have more positive emotions and less negative emotions (Andrews & Withey, 1976; Peterson et al., 2011; Guven, 2011). Thus, it is appropriate to define happiness using indicators of negative emotions.

Control variables comprise student characteristics (X_i^S), parent characteristics (X_i^P), and family characteristics (X_i^F). The first set of variables includes a student's cognitive ability, age, gender, nationality, hukou status, health condition, and siblings. The second set of variables includes the parent's education and job. The third set of variables includes family income.

According to Wen (2006), parent's education, parent's job, family income, and Hukou status are the four main factors that affect the probability of a family exercising school choice. In general, families with 1) well-educated parents, 2) members work for the government or other public institutions, 3) higher income, and 4) local Hukou or non-agricultural Hukou are more likely to exercise choice for their children.

Other control variables included are also supported by a bunch of existing studies. First, studies have found strong correlation between students' cognitive ability and academic performance (Mackintosh, 2011; Deary et al., 2007). Second, the number of siblings directly related to the per

capita income of the household as well as the amount of money and time of a family would like to spend on children’s education. Lu and Treiman’s study (2008) shows that a larger family size will dilute the resources available for each child in the family. This issue, however, is not relevant to this study since all students in the survey were born under the one-child policy¹. The specification therefore assumes each student has no siblings.

Difference- in-differences

The baseline model can generate biased results because it fails to account for the adjustment after studying in a choice school after one academic year. If the adjustment to a new learning environment takes one year, comparing choice students in the first year to those in subsequent years should isolate the impact of *disruption* on academic performance. Thus, a difference-in-differences (DID) approach would be suitable. The specification can be written as:

$$Y_{it}^j = \alpha_0 + \alpha_1 * schoolchoice^j + \alpha_2 * year_t + \beta * schoolchoice * year_t^j + \varepsilon_{it}^j \quad (2)$$

Where Y_{it}^j represents the outcome for individual i of time t in group j . α_1 measures the effect of school choice on dependent variables. $Schoolchoice^j$ indicate whether the observation is in the treatment group or control group (i.e. whether the observation engaged in school choice practices). α_2 measures the time effect. $Year_t$ equals to 1 if the observation is measured in the follow-up survey. β is the DID impact estimate assuming that’s the model assumptions hold.

Treatment Effects

Another major concern is that exercising “school choice” is not random in the population. Rather, it is a self-selection process determined by individual characteristics (i.e. student characteristics, parent characteristics, and family characteristics), and these characteristics will affect both students' grades/happiness and their preference on whether to choose schools. It is hard

¹ The one-child policy was started in late 1970s and modified in 2016.

to determine whether "school choice" lowers a student's grade and happiness or a student with a low grade and happiness is more likely to choose a school. I use the treatment effects model (TE) to account for the non-random selection due to unobservables. The model can be written such that:

$$Y^* = \alpha_l + \beta * schoolchoice_i + \delta_4 * X_i^S + \delta_5 * X_i^P + \delta_6 * X_i^F + \varepsilon_i \quad (3)$$

$$schoolchoice_i^* = \pi_i * Z_i + \mu_i \quad (4)$$

Where $schoolchoice_i = 1$ if $schoolchoice_i^* > 0$, $schoolchoice_i = 0$ if $schoolchoice_i^* \leq 0$.

Equation (3) is the same as equation (1), except that school is determined by an underlying decision. Z_i in equation (4) is a set of variables that affect whether students would engage in school choice, which includes all the control variables in equation (3) and the instrument variable, proportion of students who choose schools in the classes. On the one hand, the instrumental variable has no effect on Y^* . It makes no sense to say whether other students in the class choose school or not will affect individuals' grades or happiness. On the other hand, there is a strong positive association between whether a student can choose to study in a class and the proportion of students choosing schools in the class. Because if a class has a large proportion of students who choose schools, it means that the threshold for enrolling in the school through "school choice" practices is relatively low, and vice versa. Therefore, it is appropriate to use it as an instrument variable.

DATA DESCRIPTION

The dataset used in this research is the *China Education Panel Survey* (CEPS). CEPS is a nationally representative tracking survey project designed and implemented by the China Survey and Data Center of Renmin University of China. CEPS took the 2013-2014 school year as the baseline and took the two junior high school cohorts, grade 7 and grade 9, as the starting point of the survey. Using the average education level of the population and the proportion of the floating population as stratified variables, 112 schools in 28 county-level units (counties, districts, and municipalities) were randomly selected. 19,487 students in 438 classes answered to the survey.

To be noticed, CEPS is a longitudinal study. The designer of the survey is planning to follow-up the students in the 1st, 3rd, 4th, 7th, 8th, 17th, and 27th year after their graduation from middle school. This means the same group of participants will answer different questionnaires in each year of the survey. So far, only the baseline survey and the 1st follow-up survey have been finished. The follow-up survey in 2014-2015 was targeted to follow-up all the 10,279 7th-grade-students in the baseline survey. Of those, 9,449 (91.9%) were successfully followed-up. There were 471 new observations and 830 missing observations in the following-up survey, and this study will only focus on the observations that have data available in both surveys.

CEPS provides the raw and standardized test scores of cognitive ability and three main courses (i.e. Chinese, Mathematics, and English) of each observation. The cognitive test is designed by the survey conductor, which does not involve the specific memorizing knowledge taught in the school curriculum but measures the students' logical thinking and problem-solving abilities. The test is internationally comparable and nationally standardized. Students' test scores for the three courses are directly provided by their schools, so there is no bias or error in the data. Besides, the designers of CEPS conduct different questionnaires to investigate students and their parents or guardians,

teachers, and school principals. All the other information needed for this research can be found in the survey of students and their parents.

In the dataset, any students and their families that engaged in the following behavior will be defined as “school choice” participants and treated as treatment group: 1) asking friends for help, 2) giving presents to the related government/school leaders, 3) paying extra fees, 4) buying a house/apartment in the “education district” where this school is located, 5) changing the location of the Hukou of the family, 6) transferring the Hukou of the family or this child under other relatives or friends, 7) letting this child take all kinds of achievement tests, 8) other related practices. Others will serve as the counterfactual group. As discussed in the introduction section, Chinese parents typically choose school for their children by spending money, abusing power for privilege, or purchasing houses in specific educational districts. Table 1 provides descriptive statistics for the core independent variable.²

Table 1. Descriptive Statistics of School Choice

Variable	Mean	Std. Dev.
School choices	0.25	0.43
Choose school by spending money	0.02	0.15
Choose school by using privilege	0.12	0.32
Choose school by changing Hukou	0.09	0.28
Choose school by using money and privilege	0.01	0.10

² School choice practices can be break into four different categories. Category one (i.e. choosing school by spending money) includes the behavior of paying extra fees; Category two (i.e. choosing school by abusing privilege) includes the behavior of asking friends for help; Category three (i.e. choosing school by changing Hukou location of the family) includes behaviors of buying a house/apartment in the “education district” where this school is located, changing the location of the Hukou of the family, and transferring the Hukou of the family or this child under other relatives or friends; Category four (i.e. choosing school by using money and privilege) include the behavior of giving presents to the related government/school leaders.

³ In the English version of CEPS baseline parent data, the labels on variables bc0201 – bc0209, which indicate whether the family engaged in any school choice practices or not, are inconsistent with that in the Chinese version of the data. In the Chinese data, the variables = 1 if the label is “YES” and = 0 if otherwise. The labels on the variables are flipped in the English version of data. Since the survey was first conducted in Chinese, it should be credible to use the Chinese version. Evidence from the article “*CEPS shows, one fourth of the families engaged in school choice when moving from primary school to middle school*” that published in Guangming Daily (2017) also indicates the Chinese version is appropriated to use. Retrieved from: <https://www.shobserver.com/news/detail?id=52316>

The descriptive statistics show that one fourth (25%) of the families in the sample have engaged in “school choice.” 2% of the families choose school by paying extra fees, 12% by turning to people in power, 9% by changing the location of Hukou, and 1% by bribing people in power.

Two concerns about the data are worth discussing. First, not all variables were defined consistently or available over time. For the deleted variables, I copied the result from the baseline survey since these variables are not likely to change in one academic year (i.e. whether the student exercise school choice, gender). The variables that have been redefined are the ones for parents' education levels and occupations. In the baseline survey, the information is derived from the student survey, because only the respondents (either fathers or mothers) to the parent survey are asked to report their education levels and occupations, which provide much less information than that in the student survey. However, in the follow-up survey, the information is provided by parents rather than students.

Second, some information is reported in both the student and parent survey. To be specific, each student's Hukou status, health condition and family financial condition are separately reported. To make sure I use the most reliable ones in my study, I use the data for student's current health situation in the student survey, because students can report their own feelings more precisely than their parents. Similarly, parents can give more accurate information about the Hukou status and family financial condition.

Appendix A lists sources and definitions of all the variables I use. For all the 10,520 observations without any missing values, Table 2 provides descriptive statistics of dependent variables. Descriptive statistics of all control variables can be found in Appendix B.

Table 2. Descriptive Statistics of Dependent Variables

	Full Sample		Treatment Group (School Choice)		Control Group	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Std. Chinese score	70.82	9.43	69.88	9.70	71.13	9.32
Std. Math score	70.76	9.60	69.99	9.63	71.01	9.60
Std. English score	70.82	9.45	69.75	9.71	71.17	9.33
Happiness1(Never/seldom feeling blue)	0.61	0.49	0.59	0.49	0.62	0.49
Happiness2(Never/seldom depressed)	0.70	0.46	0.62	0.48	0.70	0.45
Happiness3(Never/seldom unhappy)	0.63	0.48	0.60	0.49	0.63	0.48
Happiness4(Never/seldom not enjoying life)	0.80	0.41	0.79	0.41	0.79	0.40
Happiness5(Never/seldom sad)	0.71	0.45	0.71	0.46	0.72	0.45

Surprisingly, students who exercised school choice have lower test scores than peers who remained in their assigned schools, which is contradicting with my first hypothesis. Identifying with Li's study, the students who chose schools are less happy than their counterparts. Combining the two findings, choice students probably perform worse in school because they are less happy. All the average values on "happiness" decrease in the follow-up survey, which implies that students suffer more from negative emotions when they are in grade 8 than in grade 7.

EMPIRICAL RESULTS

Baseline Results

Table 3 and Table 4 display the results of the baseline model. Regressions in Table 3 examine the effect of school choice on students' academic achievement. Regressions (1) to (3) are OLS specifications that do not include any control variables. Regressions (4) to (6) are full models that control for: year of survey, student's cognitive ability test score, gender, age, nationality, Hukou status, health condition, siblings, mother's education, father's education, mother's occupation, father's occupation and family income.

The results shown in Table 3 are consistent with my descriptive statistics, which indicate that *school choice* is negatively associated with students' grades at 1% significant level. The magnitude of coefficients on students' test scores slightly shrinks when the full-set of control variables are included in model (4) to (6), but the result is still negative and statistically significant at the same level. The English score is more sensitive to school choice compared to the other two subjects. On average, English is the toughest subjects for Chinese middle-school students, because not all the students have taken English courses from the 1st grade in their elementary schools. Some students even had never an taken English course before they entered middle schools. Thus, the differentiation in English test score is more significant. Holding all the other predictors in the full model constant, exercising choice decreases a student's English test score by 1.7%. Since the standard deviation of natural logarithm of standardized English test score is 0.15, school choice has not caused a meaningful shift of test score. In other words, the negative effect of school choice on test score is not substantively significant. Although the results seem to be contradictory to my first hypothesis, they can actually strengthen the conclusion I'm expecting, which indicates that "school choice" is not a panacea for Chinese students' comprehensive development.

Except for students' health condition and parents' occupation, all the control variables included in full models are statistically significant at the 5% level. Basically, the estimated impacts of gender, age, nationality, hukou status, whether the student is the only child in her/his family, and family income on test scores are all negative for all the models. This indicates that students who are 1) male, 2) elder, 3) Han, 4) the only child in their families, or 5) born in affluent families are likely to perform worse in tests than their counterparts. On the contrary, students whose cognitive test scores are higher, and whose parents are well-educated tend to have higher academic achievement.

Table 3. OLS Regression Analysis of the Effect of School Choice on Students' Academic Achievement

	Std.	Std.	Std.	Std.	Std.	Std.
	Chinese	Math	English	Chinese	Math	English
	Score (ln)					
	Basic			Demographic Controls		
	(1)	(2)	(3)	(4)	(5)	(6)
School Choice	-0.018*** (0.003)	-0.015*** (0.003)	-0.022*** (0.003)	-0.015*** (0.003)	-0.015*** (0.003)	-0.017*** (0.003)
_cons	4.25*** (0.002)	4.25*** (0.002)	4.26*** (0.002)	4.38*** (0.026)	4.38*** (0.026)	4.40*** (0.026)
Controls	No	no	no	yes	yes	yes
N.	10,520	10,520	10,520	10,520	10,520	10,520
Adjusted R ₂	0.0030	0.0019	0.0041	0.1833	0.1773	0.1821

Standard errors are given in parentheses under the coefficients. The individual coefficient is statistically significant at the *10%, **5%, or ***1% significant level.

The correlation between school choice and students' short-term well-being, however, is in line with my conceptual prediction. Table 4 gives the results of the marginal effect of school choice on students' short-term well-being holding all the predictors at their average level. Similarly, regressions (1) to (5) are baseline models. Regressions (6) to (10) are full models that control for the same set of variables as in Table 3. In general, school choice is negatively correlated with

students' short-term well-being. Students who study in the schools chosen by unrecognized means are more likely to feel blue, depressed, unhappy, not enjoying life and sad in their school lives. Only the first three indicators of "happiness" are statistically significant in both models. Adding control variables to the regression increases the magnitude of the coefficients on students' short-term well-being.

Of all the control variables, only students' cognitive test score, health condition, and family income are always statistically significant throughout all the regressions. All of the three control variables listed are positively associated with students' happiness, which means students with higher cognitive test scores, better physical conditions, and wealthier families are more likely to enjoy their school lives.

Table 4. Probit Regression Analysis of the Marginal Effect of School Choice on Students' Short-term Well-being

	Happiness1 (Never/seldom feeling blue)	Happiness2 (Never/seldom depressed)	Happiness3 (Never/seldom unhappy)	Happiness4 (Never/seldom not enjoying life)	Happiness5 (Never/seldom sad)
	(1)	(2)	(3)	(4)	(5)
School Choice	-0.029*** (0.011)	-0.030** (0.011)	-0.026** (0.011)	-0.002 (0.009)	-0.012 (0.010)
Controls	no	no	no	no	No
_cons	0.31*** (0.01)	0.53*** (0.01)	0.34*** (0.01)	0.82*** (0.02)	0.57*** (0.02)
N.	10,520	10,520	10,520	10,520	10,520
Pseudo R ²	0.0005	0.0007	0.0004	0.0000	0.0001
	(6)	(7)	(8)	(9)	(10)
School Choice	-0.033*** (0.011)	-0.033*** (0.011)	-0.033*** (0.011)	0.002 (0.010)	-0.016 (0.010)
Controls	yes	yes	yes	yes	Yes
_cons	-0.64** (0.25)	0.14*** (0.26)	-1.28*** (0.24)	-0.45 (0.28)	-0.80*** (0.26)
N.	10,520	10,520	10,520	10,520	10,520
Pseudo R ²	0.0334	0.0524	0.0438	0.0529	0.0377

Standard errors are given in parentheses under the coefficients. The individual coefficient is statistically significant at the *10%, **5%, or ***1% significant level.

Subsample Regressions Results

Parents can access choice in four different ways: spending money, abusing power for privilege, purchasing a house in a specific educational district and change Hukou status, and using both money and privilege. The data allow us to examine how different types of school choice behaviors affect students' test scores and short-term well-being. Tables 5 and 6 present results, including control for the full set of variables.

Table 5 displays the results of how students' test scores react to different types of school choice behaviors. For those who chose school by spending money, none of the coefficients is statistically significant. Similar to the results from Table 3, students who chose school by the other three types of practices are predicted to have lower test scores for all of the three subjects. The coefficient of the fourth school choice behavior on students' test scores has the highest magnitude, which indicates that students who chose a school by using both money and privilege are predicted to have the lowest test scores comparing to students who did not choose a school or chose school through other methods. Because these students are the worst-performing ones, it is reasonable that their parents need to devote more resources to get them into the chosen schools. Also, Math scores and English scores are generally more sensitive to all types of school choice practices since the magnitude of coefficients on those two subjects tends to be larger than that of Chinese test scores.

Table 5. OLS Regression Analysis of the Effect of Different School Choice behaviors on Students' Academic Achievement

	Std. Chinese Score	Std. Math Score	Std. English Score
	(ln)	(ln)	(ln)
	(1)	(2)	(3)
Choose school by spending money	0.003 (0.009)	0.002 (0.009)	-0.004 (0.009)
N.	10,518	10,518	10,518
Adjusted R	0.1816	0.1757	0.1797
Choose school by using privilege	-0.011*** (0.004)	-0.014*** (0.004)	-0.013*** (0.004)
N.	10,520	10,520	10,520
Adjusted R	0.1820	0.1764	0.1804
Choose school by changing Hukou	-0.024*** (0.005)	-0.027*** (0.005)	-0.027*** (0.005)
N.	10,520	10,520	10,520
Adjusted R	0.1835	0.1780	0.1821
Choose school by using money and privilege	-0.034*** (0.013)	-0.050*** (0.013)	-0.051*** (0.013)
N.	10,518	10,518	10,518
Adjusted R	0.1821	0.1769	0.1809

Standard errors are given in parentheses under the coefficients. The individual coefficient is statistically significant at the *10%, **5%, or ***1% significant level.

The results of the effect of different school choice behaviors on students' short-term well-being are displayed in Table 6. Different types of school choice practices do not have a consistent or statistically significant impact on students' "Happiness." Privilege, in the form of connection, and the ability to change Hukou, do have benefits that enable families to access choice. Surprisingly, students who access choice through privilege are less likely to be unhappy (not enjoying their lives) than students did not choose school or chose school through other methods, and the coefficients

on this predictor is statistically significant at 5% level. It is undoubtable, however, all of the school choice behaviors are likely to negatively correlated with students' short-term well-being.

Table 6. Marginal Effect of Different School Choice behaviors on Students' Short-term Well-being

	Happiness1 (Never/seldom feeling blue)	Happiness2 (Never/seldom depressed)	Happiness3 (Never/seldom unhappy)	Happiness4 (Never/seldom not enjoying life)	Happiness5 (Never/seldom sad)
	(1)	(2)	(3)	(4)	(5)
Choose school by spending money	-0.049 (0.032)	-0.074** (0.031)	-0.029 (0.031)	0.033 (0.023)	0.002 (0.029)
<i>N.</i>	10,518	10,518	10,518	10,518	10,518
Adjusted R	0.0330	0.0522	0.0432	0.0531	0.0376
Choose school by using privilege	-0.046*** (0.015)	-0.023 (0.014)	-0.027* (0.015)	0.026** (0.012)	-0.002 (0.014)
<i>N.</i>	10,520	10,520	10,520	10,520	10,520
Adjusted R	0.0335	0.0519	0.0434	0.0533	0.0376
Choose school by changing Hukou	-0.038** (0.018)	-0.049*** (0.017)	-0.022 (0.018)	-0.021 (0.015)	-0.022 (0.016)
<i>N.</i>	10,520	10,520	10,520	10,520	10,520
Adjusted R	0.0332	0.0524	0.0433	0.0531	0.0377
Choose school by using money and privilege	-0.042 (0.047)	-0.033 (0.044)	0.020 (0.045)	-0.005 (0.038)	-0.010 (0.042)
<i>N.</i>	10,518	10,518	10,518	10,518	10,518
Adjusted R	0.0329	0.0518	0.0431	0.0529	0.0376

Standard errors are given in parentheses under the coefficients. The individual coefficient is statistically significant at the *10%, **5% or ***1% significant level.

Difference-in-Differences Method

Although the difference-in-differences (DID) method is not exactly appropriate to use to analyze the CEPS data, since students had already studied in the schools they chose or assigned to before the survey started and the “treatment” was not happening between the baseline survey and the follow-up survey, it doesn’t mean the DID analysis is meaningless for this thesis. What the data may allow is examining how students *adjust* after moving to a chosen school.

Table 7 gives the average values of test scores and indicators of short-term well-being for all students in both the baseline survey and follow-up survey. The differences between “treatment group” and “control group” are consistent with baseline results: students who engaged in school choice practices are likely to have lower test scores and be less happy than their counterparts. Unsurprisingly, all of the DID estimators are statistically insignificant. However, it is interesting to see that students’ average Chinese and English test scores dropped in the follow-up survey comparing to the baseline survey, while the average Math score increased. Moreover, the Chinese test score dropped less, and the Math test score increased more for students who chose school than their counterparts. This indicates that the negative effect of school choice on students’ academic achievement becomes weaker in the follow-up survey.

For students’ short-term well-being, all the indicators for “happiness” get smaller in the follow-up survey, which implies that students are less happy in their second year of middle school than in their first year. Students who chose school tend to be affected more by negative emotions in the follow-up survey than their counterparts in particular. School choice, in general, still has a more negative impact on students rather than positive influence.

Table 7. Academic Achievement among students who chose school and who did not choose school: Baseline Survey and Follow-up Survey

	Treatment Group		Control Group		Difference in Differences
	baseline survey	follow-up survey	baseline survey	follow-up survey	
Std. Chinese Score	70.658	69.102	71.963	70.298	0.109 (0.423)
Std. Math Score	70.631	71.81	69.343	70.218	0.304 (0.431)
Std. English Score	70.624	68.868	71.967	70.376	-0.165 (0.423)
Happiness1	0.622	0.562	0.645	0.597	-0.011 (0.022)
Happiness2	0.732	0.613	0.762	0.644	-0.001 (0.021)
Happiness3	0.622	0.589	0.636	0.629	-0.025 (0.022)
Happiness4	0.819	0.763	0.822	0.763	0.003 (0.018)
Happiness5	0.724	0.687	0.731	0.703	-0.01 (0.020)

Standard errors are given in parentheses under the coefficients. The individual coefficient is statistically significant at the *10%, **5%, or ***1% significant level.

Treatment Effect Model

Since the negative effect of school choice on students' academic achievement and short-term well-being might run into self-selection bias, I use a treatment effect (TE) model to test whether there is non-random selection through unobservables not controlled for in the model.

In Table 8, the coefficients on school choice derive from linear regressions with endogenous treatment. Since it is not appropriate to use linear regression to predict binary dependent variables, only variables for students' academic achievement are applicable for this two-stage TE model. The regressions control for the full set of variables as in the baseline results. In the school choice

equation, the coefficients on instrument variable -- the proportion of students who choose schools in the classes – are statistically significant and strongly correlated with school choice as expected. In the students’ academic achievement equation, school choice is still predicted to negatively affect students’ test scores. Since the null hypothesis of the LR test in the TE model is “ $\rho = 0$ (i.e. the model is free from non-random selection), the results of the LR test indicate that ρ does not equal zero and is statistically significant. This finding implies that there is non-random selection through unobservables not controlled for in the model. The value of ρ and the coefficient on the instrument variable are both positive, which implies that the negative coefficient on school choice is positively biased.

Table 8. Results of Treatment Effect Model

	Std. Chinese Score (ln)	Std. Math Score (ln)	Std. English Score (ln)
	(1)	(2)	(3)
School Choice	-0.045*** (0.011)	-0.036*** (0.009)	-0.045*** (0.009)
School Choice Ratio	3.24*** (0.10)	3.25*** (0.10)	3.25*** (0.10)
Controls	Yes	Yes	Yes
N.	10,230	10,230	10,230
Wald test (P value)	2167.17 (0.0000)	2021.54 (0.0000)	2118.65 (0.0000)
ρ (rho) (LR test)	0.153*** (10.99)	0.1109*** (7.13)	0.140*** (12.77)

Standard errors are given in parentheses under the coefficients. The individual coefficient is statistically significant at the *10%, **5%, or ***1% significant level.

To sum up, although the models are not perfect, the results are strong enough to support the fact that school choice is not as helpful as what Chinese parents expected. Of course, the benefits may be in the long run, through connections and peers accompanied. While in the short run, no matter whether controlled for student’s characteristics, parent’s characteristics, and family’s

characteristics, students who engaged in school choice practices are always likely to have lower test scores and are less happy than their counterparts.

CONCLUSION

This thesis finds unexpected impacts of school choice on Chinese students at the stage of compulsory education using the data from CEPS. The results show that school choice has a statistically significant and small negative impact on students' academic achievement as measured by Chinese, Math, and English test scores. At the same time, students exercising choice are likely to be more unhappy than their counterparts in most cases. *How* families access choice also impacts student outcomes. Only those who spend money (i.e. pay extra fees) escape the negative impact of choice on students' academic performance. Choosing a school by using both money and privilege has the strongest negative impact on students' academic performance. English and Math test scores tend to be more sensitive to school choice behavior than Chinese because these two subjects are tougher for students in China. Choosing school by using privilege and changing Hukou generally leads to a stronger negative impact on students' short-term well-being. All the findings indicate that Chinese students do not benefit in the short term from school choice in their school life as their parents expected.

These empirical findings have a wide range of policy implications for Chinese policymakers. First, the government should limit choice by strictly enforcing the proximity-based admission in compulsory education enrollment. An unenforceable governance system of school choice is not better than none at all. Governing school choice and strictly enforce the proximity-based admission should not only depend on the top-down control of the government but also require the integration of different stakeholders. Schools and families need to make changes spontaneously other than simply waiting until public power recognize and penalize every suspicious behavior. Second, the governance of school choice should be compromised with balanced development of education. In an equalized public education system, the educational resources and quality of educators should

be similar in each public school, so that there will be no reason for students and their families to take unnecessary risks to choose school. The existing preferential policies for educational equalization have provided personnel and funding support for vulnerable school districts and students to improve the educational infrastructure and environment. However, the ostensible support sometimes cannot be closely integrated with the actual demands of the targeted groups. For example, the Chinese government has subsidized and equipped rural schools with multimedia teaching system in the past few years, but not all the rural teachers are familiar with the new equipment. Without appropriate training for rural teachers, simply investing in the infrastructure can actually be a huge waste of money. Thus, the preferential policies need to change from simple financial aid to more detailed plans combined with specific needs. Third, parents are eager to choose the best school for their children can be largely explained by the cliché of "don't let your children lose at the starting line." They tend to believe that if their children cannot get into the best school at their early age, they will not be a success in life. The education system should not become a "battlefield" because of outdated ideas. It is necessary for the government to take advantage of digital information and guide Chinese parents to establish a brand-new view of education.

Admittedly, this empirical research suffers from two major limitations. First, students are observed after they have made their choice decision and moved. This limitation eliminates the use of a DID model that estimates the actual impact of school choice. Second, there is likely non-random selection on unobservables not controlled for in the model so that the results may be biased.

However, even with these limitations, this thesis generates new insights into the effect of school choice on Chinese students in the short-term. Further examination should examine the reasons and channels through which school choice negatively affects students' academic achievement and short-term well-being in Chinese compulsory education.

APPENDIX A. Description of Variables

Variable	Short	Source	Description
Dependent variables:			
Standardized Chinese score	std_chn	Baseline & follow-up student survey	the standardized scores are calculated separately by school based on students' original scores, which means are adjusted to 70, standard deviations are adjusted to 10.
Standardized Math score	std_mat	Baseline & follow-up student survey	
Standardized English score	std_eng	Baseline & follow-up student survey	
Never/seldom feeling blue	happiness1	Baseline & follow-up student survey	= 1 if never/seldom feeling blue in the last seven days; = 0 if sometimes/often/always feeling blue in the last seven days
Never/seldom depressed	happiness2	Baseline & follow-up student survey	= 1 if never/seldom depressed in the last seven days; = 0 if sometimes/often/always depressed in the last seven days
Never/seldom unhappy	happiness3	Baseline & follow-up student survey	= 1 if never/seldom unhappy in the last seven days; = 0 if sometimes/often/always unhappy in the last seven days
Never/seldom not enjoying life	happiness4	Baseline & follow-up student survey	= 1 if never/seldom not enjoying life in the last seven days; = 0 if sometimes/often/always not enjoying life in the last seven days
Never/seldom sad	happiness5	Baseline & follow-up student survey	= 1 if never/seldom sad in the last seven days; = 0 if sometimes/often/always sad in the last seven days
Core independent variable:			
School choice	schoolchoice	Baseline parent survey	=1 if has 1) asking friends for help, 2) giving presents to the related government/school leaders, 3) paying extra fees, 4) buying a house/apartment in the "education district"

			where this school is located, 5) changing the location of the Hukou of the family, 6) transferring the Hukou of the family or this child under other relatives or friends, 7) letting this child take all kinds of achievement tests, 8) other practices; = 0 if has done none of the above
Control variables:			
Survey year	year	Baseline & follow-up student survey	= 0 if the observation derives from the baseline survey, = 1 if the observation derives from the follow-up survey
Cognitive ability test score	std_cogscore	Baseline & follow-up student survey	The standardized cognitive ability test score estimated by IRT model based on three dimensions of the test (language, shape and logic)
Gender	male	Baseline student survey	= 1 if male; = 0 if female
Age	age	Baseline student survey	= survey year – year of birth
Nationality	han	Baseline student survey	= 1 if nationality is “Han”; = 0 if otherwise
Local Hukou	localhukou	Baseline & follow-up parent survey	= 1 if Hukou is currently in the local county/district; = 0 if not in the local county/district
Agricultural Hukou	agrihukou	Baseline & follow-up parent survey	= 1 if the student currently holds an Agricultural Hukou; = 0 if otherwise
Health condition (rank 1 to 5)	health	Baseline & follow-up student survey	= 1 if very poor; = 2 if not very good = 3 if moderate; = 4 if good; = 5 if very good
Only child	onlychild	Baseline & follow-up student survey	= 1 if the student is the only child in her/his family; = 0 if otherwise
Mother’s education (less than grade 9)	mo_ls9grade	Baseline student survey & follow-up parent survey	= 1 if none/ finished elementary school/ junior high school degree; = 1 if otherwise

Mother's education (high school graduate)	mo_hsgrad	Baseline student survey & follow-up parent survey	= 1 if technical secondary school or technical school degree/ vocational high school degree/ senior high school degree; = 0 if otherwise
Mother's education (at least college)	mo_college	Baseline student survey & follow-up parent survey	= 1 if junior college degree/ bachelor degree/ master degree or higher; = 0 if otherwise
Father's education (less than grade 9)	fa_ls9grade	Baseline student survey & follow-up parent survey	= 1 if none/ finished elementary school/ junior high school degree; = 1 if otherwise
Father's education (high school graduate)	fa_hsgrad	Baseline student survey & follow-up parent survey	= 1 if technical secondary school or technical school degree/ vocational high school degree/ senior high school degree; = 0 if otherwise
Father's education (at least college)	fa_college	Baseline student survey & follow-up parent survey	= 1 if junior college degree/ bachelor degree/ master degree or higher; = 0 if otherwise
Mother's occupation (whether work for government)	mo_gov	Baseline student survey & follow-up parent survey	= 1 if the student's mother work as a government official, staff of public institutions, civil servant; = 0 if otherwise
Father's occupation (whether work for government)	fa_gov	Baseline student survey & follow-up parent survey	= 1 if the student's father work as a government official, staff of public institutions, civil servant; = 0 if otherwise
Family income (rank 1 to 5)	faminc	Baseline & follow-up parent survey	= 1 if very poor; = 2 if somewhat poor = 3 if moderate; = 4 if somewhat = 5 if very rich

APPENDIX B. Descriptive Statistics of Control Variables

	Full Sample		Treatment Group (School Choice)		Control Group	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Cognitive ability test score	0.29	0.81	0.31	0.81	0.29	0.81
Male	0.49	0.5	0.53	0.50	0.48	0.50
Age	13.35	0.97	13.41	0.97	13.33	0.97
Han	0.93	0.26	0.93	0.26	0.93	0.26
Local Hukou	0.84	0.37	0.76	0.43	0.86	0.34
Agricultural Hukou	0.51	0.50	0.49	0.50	0.51	0.50
Health condition (rank 1 to 5)	4.02	0.91	4.03	0.91	4.01	0.91
Only child	0.48	0.50	0.49	0.50	0.48	0.50
Mother's education (less than grade 9)	0.60	0.49	0.56	0.50	0.61	0.49
Mother's education (high school graduate)	0.23	0.43	0.25	0.43	0.23	0.42
Mother's education (at least college)	0.17	0.38	0.19	0.39	0.17	0.37
Father's education (less than grade 9)	0.54	0.50	0.50	0.50	0.55	0.50
Father's education (high school graduate)	0.27	0.44	0.28	0.45	0.26	0.44
Father's education (at least college)	0.19	0.40	0.22	0.42	0.18	0.39
Mother's job (government)	0.03	0.16	0.04	0.19	0.02	0.15
Father's job (government)	0.45	0.21	0.05	0.23	0.04	0.20
Family income (rank 1 to 5)	2.84	0.58	2.90	0.56	2.82	0.58

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