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Best Evidence of Chinese Education

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Best Evidence of Chinese Education

EDITORS

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Note to Contributors

Best Evidence of Chinese Education (BECE) is published under the auspices of the *Best Evidence in Brief (BEiB)* (http://www.cnbeb.org.cn:81/) to provide authoritative, critical surveys on the current status of subjects and problems in the diverse fields of Chinese education.

BECE only accepts manuscripts that have been reviewed and approved by our worldwide distinguished expert editors as well as been released on the *BEiB* website first. *BECE* only publishes four types of manuscript: Editorial, Newsletter, Article, and Review. Editorial is an invited perspective written by our editors. Newsletter, Article, and Review should be the English version of the original Chinese version, and they should be solicited and cutting-edge in contents in corresponding research fields.

All selected manuscripts that have appeared on the *BEiB* website need to be submitted online (http://scinedu.bonoi.org/basicpage/submission) to the system for being processed further. In addition, the following suggestions may serve as a general guide.

Authors should note that they are writing for an international audience. National colloquialisms and idiomatic use of language should be avoided to the extent possible. Word choices and sentence constructions that might imply bias against persons on the basis of gender, racial or ethnic group membership, disability, sexual orientation, or age should be avoided.

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Judicious selection of references is an important function of the authors. Cited references should be listed alphabetically according to author, and the author's last name and publication year should be used in the text. The full title of each paper should be given. Each citation should be checked with the original publication to avoid embarrassing errors. The system used in the Chemical Abstracts for abbreviations of journal names should be followed.

The acceptability of a manuscript cannot, of course, be finally decided until the finished product has been examined. The acceptance is contingent upon the advice of the Editor-in-Chief and our well-known editors of the *BECE*.

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EDITORIAL

Editor's Remark

IN 2016, the Center for Research and Reform in Education at Johns Hopkins University, led by Professor Robert Slavin, kicked off an e-newsletter called *Best Evidence in Brief* (BEiB) which presents the latest empirical studies in education from the world's top academic journals. Today this effort expands to the UK, Hong Kong, and Spain, including the Institute for Effective in Education of the University of York and the Centre for University and School Partnership Faculty of Education of the Chinese University of Hong Kong, and the La Caixa Foundation. Currently the majority of the selected studies in BEiB are from English-speaking countries. In 2018, the International Research Center for Educational Development and Evaluation at Nanjing Normal University joined the BEiB family to further promote evidence-based reform in education in the Chinese speaking region. One of the main focuses of the BEiB in China is evidence-based research studies published in Chinese educational academic journals since its launched, the Chinese BEiB has been well-received by the Chinese educational communities.

During the past 40 years, reform and development in China have undergone earth-shaking changes, including the extensive use of rigorous research methods in research. An increasing number of researchers have applied sophisticated research methods to explore the link between theories and educational reform, and dialectical thinking and scientific thinking. With the exchanges in educational circles from home and abroad, more and more researchers have learned the latest educational methods from Europe and North America. Many young researchers, who have the overseas training, are familiar to those concepts, including research samples, research hypotheses, research variables, effect sizes, causal relationships, and related relationships. These are the days that Chinese educational academic journals should pay attention to both evidence-based reforms and experimental research results in education. Happily, the proportion of empirical research studies published in Chinese education-related journals is growing.

In order to introduce the achievements of China's educational research, especially the results of Chinese empirical researches, to the world's educational research peers, our team at Nanjing Normal University partnered with Insights Publisher in the United States to establish the journal of *Best Evidence of Chinese Education* so that countries around the world can fully understand the present situation of China's educational research. The journal's founding has been strongly supported by world-class educational empirical research experts. Professor Robert Slavin, a world-famous scholar from Johns Hopkins University, has been invited to be the chair of the editorial board. Many professors from world-renowned universities serve as editors of

journals. Professor Alan Cheung of The Chinese University of Hong Kong is the editor-in-chief of the journal. We believe that with the support of so many world-renowned scholars, *Best Evidence of Chinese Education* will become a valued contributor to the field of reporting educational empirical research.

Best Evidence of Chinese Education focuses on evidence-based researches concerning China's education reform and development. Its content is drawn mainly from the *Best Evidence in Brief* newsletter in China. Any manuscript selected by an expert review can be translated into English for full-text publication or abstract publication. With the efforts of scholars and editorial team of *Best Evidence in Brief*, our journal will contribute to the introduction of educational research results in China and the diversification of world education research.

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Can Principal Leadership Style Influence Teachers' Teaching Innovation? On the Mediating Effect of Schools' Organizational Innovation Climate

By Hou H.

A study published in *Educational Science* using cluster sampling and random sampling, investigates 1,022 teachers from 30 primary and secondary schools to explore the mechanism of leadership support and environment climate for teachers' teaching innovation. With the help of Burns' classification, this study divides the types of principal leadership into transformational and transactional types, which are collectively called principal leadership styles. Research shows that:

The leadership style of primary and secondary school principals is positively promoting teachers' teaching innovation (path coefficients are 0.61 and 0.38, respectively). Both transformational leadership and transactional leadership have positive predictive effect on teachers' teaching innovation, but the predictive effect of the latter on teachers' teaching innovation is generally lower than that of transformational leadership. The reason for this is that transactional leadership is a kind of leadership mode which exchanges benefit compensation for subordinates' hard work and emphasizes contractual goal-oriented management.

Leadership style of primary and secondary school principals positively influences the organizational innovation climate (path coefficients are 0.81 and 0.59, respectively). Transformational leadership plays a key role in creating an innovative atmosphere of school organization through heuristic guidance and ideal vision of school organization for teachers, while transactional leadership attracts teachers to explore innovative teaching models by means of position promotion and material reward.

The school organizational innovation climate ensures the implementation of teachers' teaching innovation (path coefficient is 0.66). This study finds that team support and organizational incentive mechanism in innovative work environment are positively correlated with subordinates' organizational innovation behavior.

School innovation atmosphere mediates the influence of principals' leadership style and teachers' teaching innovation. This study shows that transformational leadership has more prominent advantages in creating an innovative school organizational environment and establishing

a high-level team of innovative teachers. Only through the creation of school innovation climate, can transactional leadership have a significant impact on teachers' teaching innovation.

The author proposes that principals should play the role of transformational leadership, by the guidance of innovation and the demonstration of example. They also need to use transactional leadership to establish a management mechanism of clear rewards and punishments to meet teachers' basic material needs and related interests. Then we create school innovation climate for the teachers with professional development, good working conditions and teamwork.

Source: Educational Science 2018; 34(1):26-32.

What are the Differences between Father and Mother in the Influence of Involvement Behavior on Adolescents' Prosocial Behavior and Their Mechanisms?

By Hou F., Wu X.C., Zou S.Q., Liu C., Huang B.B.

A study published in *Psychological Development and Education* explores the influence of parental involvement behavior on the prosocial behavior of adolescents by the structural equation model. Questionnaire of parental involvement (adolescent version), parent-child attachment questionnaire and prosocial behavior questionnaire were carried out on 2,370 students in the fifth grade, the second grade of junior middle school and the second grade of senior high school from 20 primary and secondary schools in Beijing, Guangdong, Henan, Liaoning, and other provinces through convenient sampling. The research shows that:

Adolescents' perceived parental involvement significantly positively predicted adolescents' pro-social behavior, and the influence of mother's was significantly greater than that of father's.

Parent-child attachment plays an intermediary role in the influence of parental involvement on the prosocial behavior of adolescents;

There are differences in the mechanisms in which father and mother involvement influence adolescents' prosocial behavior. While father-child attachment fully mediates the association between father involvement and prosocial behavior; mother involvement implements positive effect on prosocial behavior through mother-child attachment's partly mediation, and negative effects through the suppressing effects of father-child attachment.

In addition, the author makes a detailed analysis of this study, and gives some reminders and suggestions on the relevant research variables, methods, and perspectives so as to facilitate the future research.

Source: Psychological Development and Education 2018; 34:417-415.

Effect of Flipped Classroom on Students Outcome

By Wang C. & Hu Y.

FLIPPING the classroom is a way for students to study the content prepared by the teachers or others after class, and complete the learning tasks and discuss problems with teachers in the school. The impact of flipping classrooms on students' academic performance has attracted the attention of scholars at home and abroad, but the relevant research results are quite different. In order to integrate the effect of flipping classrooms, Wang and Hu used meta-analysis to screen 38 literatures and evaluate the effect of this method on students' achievement.

The research team conducts literature screening according to the following five criteria: 1) The research theme was the effect of flipping classroom on students' achievement; 2) The research used experimental or quasi-experimental methods; 3) The study compared students taught with method of the flipping classroom and traditional teaching; 4) The research subjects were students in school, excluding adult learners; 5) The statistical information needed to be sufficient to calculated the effect size. Finally, 38 research samples were compiled and 48 effect sizes were available for analysis. Since the primary school students have only one research sample, the study mainly focuses on middle school and university. The analysis found that:

The flipping classroom has a positive and moderate impact on academic performance (d=0.36), which can improve students' academic performance.

The flipping classroom has a small but moderate impact on middle school students and college students ($d \approx 0.5$) and there is no significant difference, indicating that application in secondary school and university teaching has the similar prospects.

The flipping classroom has a positive but moderate impact on the academic performance of students of different disciplines and classes, and there is no significant difference.

Flipping the classroom has a positive but moderate impact on different knowledge learning (both theoretical and practical) and students with different learning outcomes, and there is no significant difference.

The authors call for the promotion of the application of flipping classrooms in teaching, and researchers should also actively carry out relevant research on primary school.

Source: Open Education Research 2018; 24(4):72-80.

The Learning Effects of e-Schoolbag

By Gu X. & Hu M.

GU and her research team conducted a meta-analysis of the learning effects of e-Schoolbag.

Their paper, published in the *e-Education Research*, analyzed and evaluated 39 papers about the effect of e-Schoolbag on learning in more than ten years. They divided the learning effects of students into cognitive aspect including academic achievements, problem solving, cognitive ability and self-regulation, and no-cognitive aspect including learning motivation, learning attitudes, learning interests, and participation in learning. At the same time, they introduced the moderator variables of learning effects to analyze the influence of different disciplines, sections, regions and experimental periods on the learning effect of e-Schoolbag. The results of the study show that:

E-Schoolbag has positive effect on students' learning with a moderately upper level (d= 0.525).

E-Schoolbag can promote students' cognitive (ES=+0.571) and non-cognitive (ES=0.532) development, which can promote the development of students' cognitive ability (d=0.761) and improve the students' learning engagement (d=1.355) and learning attitudes (d= 1.073).

The effect of e-Schoolbag on learning is influenced by moderator variables such as disciplines, sections, regions and experimental periods.

The author believes that there is still much room for improvement in the effect of e-Schoolbag on learning. It is necessary to further promote the multidisciplinary and normal use of e-Schoolbag and enhance the sustainability of their effects on learning.

Source: e-Education Research 2018; 38 (5):19-25.

An Experimental Study on Performance Pay of Rural Teachers in Northwest China

By Chang F., Dang Y., Shi Y., Liu C.

A study published by the *Journal of East China Normal University* (Education Science Edition) explored the impact of different methods of teacher performance incentives on the academic performance of rural students. The study conducted a two-year randomized intervention trail including 350 math teachers and 10,784 students in 216 primary schools in 16 counties of Shanxi province and Gansu province.

The study randomly divided 216 schools into 4 groups, including the absolute value intervention group (i.e., evaluating the teacher's performance according to the means of students' scores), value-added intervention group (evaluating the teacher's performance according to the means of the students' added grades) and value-added percentile intervention group (evaluating the teacher's performance according to the means of the students' added grades ranking). The incentive bound of the intervention group depended on the percentile ranking of the teaching quality, which was, the higher percentile of teaching quality, the higher bonus. The research found that:

1. Among all the three incentives methods, the percentile of added value can effectively improve students' mathematical academic performance.
2. Among students with different academic performance levels, the percentile of added value significantly improves the academic performance of students with learning difficulties.

As a whole, the performance-based incentives for teachers, especially the performance incentive based on the value-added percentile, can effectively promote teachers to change their teaching behavior, which will significantly improve students' academic performance and especially be conducive to improving the academic performance of students with learning difficulties.

The author believes that the performance-based pay of teachers should not only be related to students' academic performance, but also to the percentile of students' added value. Teachers should pay attention to both top and middle students, as well as students with learning difficulties and underachievers. It is also recommended to pilot and popularize such methods of teacher performance evaluation in some areas.

Source: Journal of East China Normal University (Education Science Edition) 2018; 36(4):131-141, 167.

The Effect of Family Meal on Achievement and Development of Teenagers: Evidence from Propensity Score Matching

By Sun L. & Lai K.

A study published in Global Education explores the effects of family meals on adolescent academic achievement and development. The study used the junior middle school data of China Education Panel Survey (2013-2014) including 112 schools, 438 classes and 17,630 valid samples among 28 country-level units, using the Propensity Score Matching method based on counterfactual framework, to explore the effects of family meal on the academic achievement, physical, psychological and cognitive development of adolescents. As an emphasis, the study compares the impacts of different living conditions and migration range of separated family on the effect of family meal. The study found that:

> For the whole group of Chinese teenagers, family meal has a significant positive impact on their academic achievement, physical health, mental health and cognitive ability development.
>
> This positive effect is reinforced by living with parents or moving out of the province. That means living with parents can strengthen the positive effect of family meal. What's more, the family meal plays a more important role in floating families than non-floating families and families migrating to other provinces rather than in a province, which proves that migration plays a positive regulatory role.

The author points out that family activities like the family meal is of great significance for the development of teenagers，which can be strengthened when living with parents. Family meal, especially for the migrant families from rural areas to the urban areas, can make up for the loss caused by the lack of some material resources and thus play a greater role. This also implies very important policy implications.

Source: Global Education 2018; 47(8):113-128.

Science Capital and Its Influence on 15-year-old Students STEM Career Expectations

By Du X., Zhao W., Wang J.

HOW does scientific capital affect young people's STEM career expectations? Recently, Du et al conducted a study analyze whether the scientific capital contained in family economic, social and culture status has a positive impact on STEM career expectations of 15-year-old students and the mediating role of scientific capital in it.

The study, published in *Studies in Science of Science*, divides the impact of scientific capital into the impact of pre-existing scientific capital within the family and the impact of scientific capital constrained by external structural factors. Among them, the former mainly considers whether parents are engaged in STEM-related occupations, while the latter is more concerned about students' participation in various scientific and technological activities.

The research, based on the relevant data of PISA2015 of Beijing, Shanghai, Jiangsu and Guangdong provinces, setting STEM related occupational expectations as the dependent variable, and whether parents engage in STEM related occupations and students' scientific activities as the key explanatory variables, used the random intercept model of the multi-layer logistic regression to analyzes the factors affecting STEM occupational expectations from the interaction between the school and the students. Then the study use the mediating effect to analyze how different economic and social and cultural status affect students' STEM career choices, and decompose their direct and indirect effects, and then obtains the proportion of the effects generated through the mechanism of indirect effects of scientific capital in the influence of different family economic, social and cultural status. The results of the study show that:

Whether parents are engaged in STEM-related occupations has a significant impact on student STEM career expectations, and the results are robust.

Scientific capital science activities play a full intermediary role in the impact of scientific attitudes on adolescent STEM career expectations.

The transmission of scientific capital is an important way for students of different economic, social, and cultural status (ESCS) to produce STEM occupational expectations differentiation. Among the dominant students, the role of scientific capital in the mediation of

STEM occupational expectations is more pronounced, while for middle class or low ESCE students, this role is limited.

The role of scientific capital in mediating STEM career expectations is more pronounced among students with dominant positions, while for middle class and low economic social and cultural (ESCS) students.

Compared to vocational school students, junior and high school students enrolled in ordinary schools have a much higher STEM career expectation.

Therefore, Du et al believe that the constraints of structural factors play a more important role than the individual action, so we should support the disadvantaged groups to participate in STEM education, which requires more STEM learning resources to be provided by society and schools.

Source: Studies in Science of Science 2018; 36(11):1928-1937.

Does Supplementary Education have Effects on Students' Physical Health in Primary Schools?

By Liu Z., Li Y., Wang J.

SUPPLEMENTARY education is also called shadow education. The generalized supplementary education includes academic-oriented, sports-related and other kinds of supplementary education. In many cities of China, especially in big cities, students and their parents have invested a lot of time and money in supplementary education. Previous researches mostly focused on the effects of supplementary education on students' academic performance. Professor Liu Zeyun from Beijing Normal University and his team studied the effects of supplementary education on the physical health of primary school students. Based on the valid questionnaire data and the physical fitness test data of 3,706 students in the fourth grade of primary school in some districts of Beijing in 2016-2017, this study uses regression method with the control of students' physical health during the base period and the class fixed effect. It has found that:

Academic-oriented and other kinds of supplementary education do not have effects on the physical health of primary school students. However, sports-related supplementary education can enhance students' physical health to a certain extent, which is reflected in the improvement of students' physical fitness test scores and grades, and the increase in students' excellent probability in physical fitness testing.

The effects are the same for boys and girls, but those who have better body healthy condition will get more benefits from sports-related supplementary education.

The effects of supplementary education on the physical health of primary school students do not depend on the location of the tutoring, that is, in-school and out-school supplementary education have the same effects.

Source: China Economics of Education Review 2018; 3(5):95-113.

Is There a Significant Difference in Critical Thinking Ability between the Only Child and Non-only Child College Students?

By Zhang Q. & Shen H.

A recent study published in *Fudan Education Forum* verified the differences and trends of critical thinking ability between only-child and non-only-child college students by using the data of 2016 National Undergraduate Ability Assessment and localized critical thinking ability test tools. In this study, multiple linear regression models are used to measure whether the critical thinking ability of Only-child College students is higher, and a reverse measure is used to measure the growth of critical thinking of College students. The research results provide evidence based on Chinese empirical data for the development of family resource scarcity theory and "dissipation-convergence" theory, and also provide reference for individual and family education investment. Research finds that:

> The difference of critical thinking ability scores between only-child and non-only-child college students is significant, but the difference gradually decreases with the passage of time and shows a convergence trend.
>
> In the sample of freshmen, the critical thinking ability score of Only-child College students is 1.660 higher than that of non-only-child students. The results support the theory of scarcity of family resources.
>
> During the period of higher education, the critical thinking ability of non-only-child college students increased more than that of Only-child College students. The research results support the theory of "dissipation-convergence".

The author points out that there are some limitations in this study. Firstly, due to the lack of follow-up survey data, it is impossible to directly measure the changes of college students' critical thinking ability during higher education. There may be some statistical risks in using indirect reverse measurement to measure the increment of college students' critical thinking ability. In the process of China's long-term family planning policy, there are some phenomena, such as more stringent implementation in urban areas than in rural areas, and stricter implementation in some areas than in other areas, which may lead to systematic bias in sample selection.

Source: Fudan Education Forum 2018; 16(4):59-64.

Influence of Family-school Relationship Type on Pupils' Academic Achievement: Based on a Latent Profile Analysis

By Huang F., Zhang M., Cui X., Huang X., Gan L.

A study published in *Educational Research and Experiment* explores the potential heterogeneity of family-school relationship and its impact on students' academic achievement. The study randomly selected 2021 sixth-grade students in Guangzhou, and analyzed the results of parents' questionnaire survey and students' reading literacy and math ability test by latent profile analysis and three-step method of follow-up analysis. The following conclusions were drawn:

1. According to parents' scores in three dimensions of willingness to communication, behavior of communication and approach of communication, it was found that there were three types of the family-school relationship: close, affiliated and alienated, which took the proportion of 39%, 34% and 27%, respectively.
2. In terms of students' academic performance, the children with "close" family-school relationship have the best academic performance, followed by "affiliated" and the worst "alienated", indicating that good family-school relationship can promote the students' academic performance.

The author believes that there are two main reasons for the poor performance of children with "alienated" family-school relationship: 1. Parents have the idea of separation of school and family responsibilities; 2. Lack of trust and communication between parents and schools, or communication failures caused by conflicts.

The author believes two main reasons may lead to poor performance of children with "alienated" family-school relationship: 1. Parents hold the idea of separated responsibilities between family and school. 2. The family-school relationship is lack of trust and communication or with failure communication due to opposite opinions.

In the end, the author elaborated on the importance and significance of building a good family-school relationship from three aspects of students, family and school to improve the relationship between family and school.

Source: Educational Research and Experiment 2018; 36(2):88-91.

ARTICLE

Empirical Research on the Relationship between Family Economic, Social and Cultural Status and Students' Exposure to School Bullying: Mediating Effects of Parental Support and Teacher Support

Liang Huang[1,2], Decheng Zhao[3]

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Abstract. Using survey data collected by the Organization for the Economic Cooperation and Development (OECD) in its 2015 Program for International Student Assessment (PISA2015), this study explores the relationship between family economic, social and cultural status (ESCS) and students' exposure to school bullying for students in Beijing-Shanghai-Jiangsu-Guangdong (China). Additionally, the study examines the mediating effects of parental support and teacher support on the relationship between family ESCS and students' exposure to school bullying. Lower family ESCS led to significantly increased exposure to school bullying. Parental support and teacher support mediated the relationship between family ESCS and students' exposure to school bullying, with slightly different magnitudes. The results suggest that China should continue to improve its system for school bullying prevention and treatment, and should especially focus on reducing bullying victimization among students from disadvantaged backgrounds. Further, parents in disadvantaged families should provide support and care to their children to enhance their abilities to tackle bullying victimization, and teachers should treat students fairly and guide students in socializing with their peers appropriately.

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Keywords: *PISA2015; Family ESCS; School Bullying; Parental Support; Teacher Support; Mediating Effect*

A RELATIVELY high prevalence of school bullying in China, with events of bullying and school violence being reported, has been observed recently (Wang, 2016). Bullying is widely recognized as a specific form of aggressive behavior that is repetitive, intentional, and based on a power imbalance (Smith et al., 1999). School bullying experienced by adolescent students, who are in a period of transition, has negative effects on their physical and mental health, on their academic capability and social adaptability, and can be irreversibly detrimental to the students' long-term wellbeing (Woods et al., 2004). Research reveals that bullying victimization severely hampers students' educational attainment and personality development. Students frequently exposed to school bullying have lower educational performance and are more likely to suffer from various psychological symptoms, such as anxiety, depression, loneliness, and suicidal tendencies, compared to their counterparts (Delprato et al., 2017; Kaltiala-Heino et al., 2000). In fact, the high prevalence of school bullying and its severe impacts has become a major policy concern in China. In 2016, a national anti-bullying policy, *Guidance on the Prevention and Treatment of Bullying and School Violence*, that required schools' active participation in counteracting school bullying and protecting students' rights, was promulgated by the Ministry of Education and eight other central ministries. Consequently, it is imperative for researchers and practitioners to identify the factors associated with school bullying and to help design effective policies that support and protect at-risk students (Olweus, 1994).

Of the risk factors for bullying victimization, family socioeconomic background is recognized as an important but still under-researched predictor. Prior research by scholars in other countries has shown connections between students' exposure to school bullying and their family socioeconomic backgrounds. In many cases, students with disadvantaged family backgrounds tend to suffer peer victimization at a higher rate than students from advantaged families. For example, Due et al. (2009), using data from the international 'Health Behavior in School-aged Children' study involving 35 countries, examined the socioeconomic inequality in students' exposure to school bullying and found that students from families of low affluence were more likely to be bullied. Consistent with this, Analitis et al. (2009) explored the factors associated with bullying victimization in children and adolescents aged 8 to 18 and found that students whose parents had a lower educational level reported more peer victimization. Empirical findings suggest that the inequality in students' exposure to bullying that exists in various cultural contexts may prevent some students from equally healthy development. As a result, this has become a concern for policy-makers, researchers, and practitioners worldwide.

Nonetheless, empirical research on the mechanisms underlying the inequality of

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students' exposure to bullying is limited, specifically the ways in which variances in family economic, social and cultural status (ESCS) affect the likelihood of a student being bullied. An emerging line of empirical evidence suggests social support is important in protecting students from being bullied. Students from families with lower ESCS may be more likely to be bullied because they receive less social support compared with other students (Jansen et al., 2011). As parents and teachers are the most important sources of social support for students facing possible bullying, we hypothesize that inequality in family ESCS among students may result in an inequality of parental support and teacher support and that this may further lead to inequalities in students' exposure to school bullying. Specifically, two questions guided this research:

1. What are the effects of family ESCS on students' exposure to school bullying?
2. Do parental support and teacher support mediate the effects of family ESCS on students' exposure to school bullying?

Data from students in China's four provinces of Beijing, Shanghai, Jiangsu, and Guangdong were used in this study. The findings of this study can inform the design of effective anti-school bullying policies to put into practice.

Methods

Sample

The Organization for Economic Cooperation and Development (OECD) collects data on students' abilities from countries worldwide through its Program for International Student Assessment (PISA). In the 2015 assessment round (hereafter, PISA2015), PISA for the first time included questions to evaluate bullying in schools of participating countries and economies (OECD, 2016). The school bullying variable, together with other variables in the PISA2015 database reflecting students' individual characteristics, family backgrounds and school characteristics, provided the data needed for this study. Listwise deletion was employed to exclude those cases with missing data; 8,671 15-year-old students from the PISA2015 Beijing-Shanghai-Jiangsu-Guangdong (China) database were identified as the sample of this study.

Variables

Students' Exposure to School Bullying

PISA2015 measured students' exposure to school bullying from the perspective of the victims (OECD, 2017). Students were asked to report their experiences during the past one year with six forms of school bullying actions: 1) "Others spread rumors about me"; 2) "Being left out of things by others intentionally"; 3) "Being made fun of by others"; 4) "Being threatened by others"; 5) "Others took away or destroyed my things"; and 6) "Being hit or pushed by others" (OECD, 2017). The frequency of students experiencing any one of the six forms of school bullying was classified into four categories: 1) "never or almost never"; 2) "a few times a year"; 3) "a few times a month"; and 4) "once a

week or more" (OECD, 2017). Based on Maynard et al. (2016), students with responses of "a few times a month" or "once a week or more" were defined as being exposed to that specific form of school bullying action. Students exposed to least one form of school bullying were defined as being exposed to school bullying and assigned a value of 1 for the bullying variable; other students were assigned a value of 0. In this study, 21.74% of students reported being exposed to school bullying during the past one year.

Family ESCS

PISA computed an index of family ESCS using family background information, such as parents' highest education level, parents' highest occupation status, and home possessions (OECD, 2017). The family ESCS was transformed with 0 representing the average family ESCS of OECD students and 1 representing the standard deviation (SD) of the OECD students' family ESCS. In the subset of data used for this study, student family ESCS had a mean of -0.84 and a SD of 1.12.

Parental Support

PISA2015 asked students to report the extent to which their parents support them in their daily living, school learning and other activities (e.g., "My parents are interested in my school activities," and "My parents support me when I am facing difficulties at school," and "My parents encourage me to be confident") (OECD, 2017). From the responses, PISA computed an index of parental support, which was transformed with 0 representing the average parental support of OECD students and 1 representing the SD of the OECD students' parental support. In this study, the sample students' parental support had a mean of -0.16 and a SD of 0.88.

Teacher Support

PISA2015 asked students to report the frequency of the help, care and support they got from their science teachers in classroom learning (e.g., "The teachers give extra help when students need it," and "The teachers help students with their learning," and "The teachers give students an opportunity to express their opinions") (OECD, 2017) and used this to compute an index of teacher support. Once again, the index of teacher support was transformed with 0 representing the average teacher support of OECD students and 1 representing the SD of the OECD students' teacher support. For the sample subset used here, the students' teacher support index had a mean of 0.28 and a SD of 0.92.

Control variables

Included control variables related to individual students were gender (52% males, 48% females) and study program (56% lower secondary school students, 35% upper secondary school students, and 8% vocational school students). Also included were control variables related to school characteristics: school location (37% urban schools, 63%

rural schools), school type (90% public schools, 10% private schools), school size (in hundreds of students, mean = 19.70, SD = 19.18), class size (number of students, mean = 41.66 , SD = 9.37), student-teacher ratio (mean = 12.62, SD = 8.55), proportion of all teachers fully certified (mean = 0.97, SD = 0.07), school educational material shortage (mean = 0.07, SD = 1.22), and school educational staff shortage (mean = 0.77, SD = 1.28).

Data Analysis

Data analysis involved three phases. In phase one, descriptive statistics were used to preliminarily examine whether exposure to school bullying differed among students with different family ESCS. In phase two, a binary logit model was constructed to analyze the predictive effects of family ESCS on students' exposure to school bullying. The binary logit model took the following form,

$$Y_i = \alpha_0 + \sum_{j=1}^{n} \beta_j x_{ij} + \gamma_1 ESCS_i + u_{i1} \quad (1)$$

where Y_i refers to students' exposure to school bullying, α_0 is a constant, x_{ij} is a vector of control variables, $ESCS_i$ is the student's family ESCS, and u_{i1} is the error term.

In phase three of the data analysis, a path analysis model was constructed to examine the mediating roles of parent support and teacher support on the relationship between family ESCS and students' exposure to school bullying. The path analysis model has the advantage that it can be used to simultaneously estimate casual relationships among multiple variables (Wang, 2014). The path analysis model had the following form,

$$M_{ti} = \alpha_1 + \sum_{j=1}^{n} \beta_j X_{ij} + \gamma_2 ESCS_i + u_{i2} \quad (2)$$

$$Y_i = \alpha_2 + \sum_{j=1}^{n} \beta_j X_{ij} + \gamma_3 ESCS_i + \gamma_4 M_{ti} + u_{i3} \quad (3)$$

where Y_i refers to students' being exposed to school bullying, α_1 and α_2 are constants, X_{ij} is a vector of control variables, M_{ti} are the mediating variables between family ESCS and students' exposure to school bullying, including the parental support variable (M1) and the teacher support variable (M2), and u_{i2} and u_{i3} are error terms. As parental support and teacher support are correlated, the path coefficient between the two mediating variables in the model was set to be freely estimated.

Since PISA2015 employed two-stage sampling methods to select sample students[1], for phases two and three of the data analysis, the standard errors of parameter estimates were estimated using both the final student weighting and Fay's balanced repeated replication (BRR) method with a 0.5 coefficient (OECD, 2009). Moreover, in phase three data analysis, a bias-corrected bootstrap method was employed for analysis of mediating variables. The bootstrap method as a resampling estimation method produces more accurate interval estimates (Hayes, 2009). In this study, resampling was set to 2,000

times. The software SPSS 23.0 was used to conduct descriptive statistics (phase one) and Mplus 7.0 was used to conduct data analysis (phases two and three).

Results

Descriptive Statistics

To initially explore whether students' exposure to school bullying was affected by family ESCS background, we grouped students into three categories based on their family's ECSC: (1) advantaged family backgrounds – student's family ESCS was in the top quarter of the index of the sample students' family ESCS; (2) average family backgrounds – student's family ESCS was between the 25th to 75th percentile of the index of the sample students' family ESCS; and (3) disadvantaged family backgrounds – student's family ESCS was in the bottom quarter of the index of the sample students' family ESCS. We then used descriptive statistics for each group to look for differences among groups in students' exposure to school bullying behavior. **Table 1** shows the results of the descriptive statistics. In general, students' exposure to any form of school bullying was less for students from advantaged family backgrounds (18.96%) than for students from average family ESCS backgrounds (21.55%), which, in turn, was less than that for students from disadvantaged backgrounds (24.91%). Students' exposure to school bullying differed significantly among the three types of family backgrounds ($\chi^2 = 22.75$, $p < 0.001$).

The percentage of students exposed to each specific form of school bullying similarly decreased when going from disadvantaged family backgrounds to average family backgrounds to advantaged family backgrounds. The percentage of students who reported "Being left out of things by others intentionally," or "Being made fun of by others," or "Others took away or destroyed my things," or "Being threatened by others" differed significantly among the three types of family backgrounds (Chi-squared p-value ≤ 0.01 in all tests). This further verified that differences exist in students' exposure to school bullying under different family backgrounds.

Binary Logit Model: Effects of Family ESCS on Students' Exposure to School Bullying

Given the differences observed above in students' exposure to school bullying based on different family backgrounds, we next analyzed the predictive effects of family ESCS on students' exposure to school bullying by employing a binary logit model (equation (1) above) to the data. **Table 2** displays these results. Without controlling for other variables, family ESCS had a significant negative effect on students' exposure to school bullying ($\gamma = -0.055$, $p < 0.001$). The predictive effects of family ESCS on students' exposure to school bullying remained significant after controlling for variables related to individual students ($\gamma = -0.052$, $p < 0.01$) or variables related to school characteristics ($\gamma = -0.040$, $p < 0.05$). The results of the binary logit model are consistent with the re-

Table 1. Students' Exposure to School Bullying under Different Family Backgrounds (%).

Exposure To School Bullying Actions	All Students	Disadvantaged Family Backgrounds	Average Family Backgrounds	Advantaged Family Backgrounds	x^2
Exposure to any form of school bullying	21.74	24.91	21.55	18.96	22.75***
Others spread rumors about me	6.30	6.50	6.34	6.00	0.51
Being left out of things by others intentionally	7.57	9.87	7.24	5.90	25.68***
Being made fun of by others	11.50	13.93	11.35	9.36	22.40***
Being threatened by others	3.29	4.11	3.37	2.31	11.21**
Others took away or destroy my things	12.57	14.30	12.57	10.84	11.80**
Being hit or pushed by others	4.29	4.57	4.41	3.78	1.90

*P<0.05，**P<0.01，***P<0.001

sults of the descriptive statistics and both show that students with higher family ESCS are less likely to be bullied.

Path Analysis: Mechanisms Underlying Effect of Family ESCS on Students' Exposure to School Bullying

To further explore the mechanisms underlying effect of family ESCS on students' exposure to school bullying, we conducted path analysis using path analysis equations (2) and (3) (see Methods). The weighted root mean-square residual (WRMR), an indicator of the path model fit, was 0.002, indicating a good model fit.[2]

Table 3 shows the results of the path analysis model. Results reveal that the direct predictive effects of family ESCS on students' exposure to school bullying was -0.019 ($p > 0.05$). Family ESCS affected students' exposure to school bullying indirectly through its influence on parental support and teacher support of students. The predictive effects of family ESCS on parental support was 0.138 and the predictive effects of parental support on students' exposure to school bullying was -0.086; both these path coefficients reached at least a 0.01 level of significance. The predictive effects of family ESCS on teacher support was 0.070 and the predictive effects of teacher support on students' exposure to school bullying was -0.142; both path coefficients had $p < 0.001$.

Table 2. The Predictive Effects of Family ESCS on Students' Being Exposed to School Bullying.

	Students' Exposure to School Bullying					
	Coefficient	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**
Family ESCS	-0.055***	0.016	-0.052**	0.019	-0.040*	0.020
Male (Reference group: Female)			0.423***	0.046	0.422***	0.046
Lower secondary school students (Reference group: Vocational school students)			-0.030	0.079	-0.114	0.122
Upper secondary school students (Reference group: Vocational school students)			-0.105	0.087	-0.166	0.108
Urban school (Reference group: Rural school)					-0.025	0.067
Public school (Reference group: Private school)					-0.108	0.113
School size					-0.002	0.002
Class size					0.007	0.005
Student-teacher ratio					0.003	0.003
Proportion of all teachers fully certified					0.027	0.317
School educational material shortage					0.008	0.029
School educational staff shortage					0.012	0.036
Threshold	0.833***	0.033	1.018***	0.076	1.148**	0.375
*P<0.05, **P<0.01, ***P<0.001						

Analysis of mediating variables was conducted using the bias-corrected bootstrap method. **Table 4** shows the results. The 95% bootstrap confidence interval (CI) of both the indirect effects of family ESCS on students' exposure to school bullying through parental support and the indirect effects of family ESCS on students' exposure to school bullying through teacher support did not include zero, indicating significant mediating effects. The magnitude of the mediating effects of parental support and teacher support on the relationship between family ESCS and students' exposure to school bullying were slightly different.

Thus, the mechanism underlying family ESCS effects on students' exposure to school bullying has been elucidated: students with a higher family ESCS get more parental support and teacher support, and students with more parental support and teacher support have a lower risk of being bullied. Conversely, students with lower family ESCS get less parental support and teacher support, and students with less parental support and teacher support have a higher risk of being bullied.

Table 3. Results of the Path Analysis Model. [3]

	Parental support (M1)		Teacher support (M2)		Students' Exposure to School Bullying	
	Coefficient	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**
Family ESCS	0.138***	0.013	0.070***	0.015	-0.019	0.020
Parental support					-0.086**	0.028
Teacher support					-0.142***	0.022
Male (Reference group: Female)	-0.078***	0.023	-0.090***	0.026	0.402***	0.047
Lower secondary school students (Reference group: Vocational school students)	0.026	0.094	0.113	0.071	-0.095	0.118
Upper secondary school students (Reference group: Vocational school students)	0.109	0.094	-0.024	0.064	-0.161	0.103
Urban school (Reference group: Rural school)	-0.045	0.034	0.011	0.040	-0.028	0.067
Public school (Reference group: Private school)	-0.100	0.067	-0.086	0.081	-0.129	0.109
School size	0.000	0.001	-0.001	0.001	-0.002	0.002
Class size	0.002	0.002	-0.007*	0.003	0.006	0.005
Student-teacher ratio	-0.004*	0.002	-0.008	0.005	0.001	0.003
Proportion of all teachers fully certified	0.850***	0.221	0.698	0.385	0.194	0.284
School educational material shortage	-0.017	0.016	-0.054*	0.027	-0.001	0.029
School educational staff shortage	-0.027	0.015	-0.011	0.024	0.008	0.035
Intercept	-0.816***	0.208	0.101	0.397		
Threshold					1.207***	0.386
*P<0.05, **P<0.01, ***P<0.001						

Discussion and Implications

Discussion

In this study, we found that students' exposure to school bullying differed depending on family ESCS background. Students from advantaged family backgrounds had decreased exposure to bullying (18.96%) compared to those from disadvantaged family backgrounds (24.91%). We also verified that the inequality of family ESCS is a key factor affecting the likelihood of students being bullied in the four China provinces of Beijing, Shanghai, Jiangsu, and Guangdong. Bullying victimization can hinder students' physical and mental development, their educational attainment, and undermine their social

Table 4. Mediation Analysis Using Bias-Corrected Bootstrap Method.

Influence Path	Estimate		95% Bootstrap CI	
	Coefficient	SE	Lower	Upper
Family ESCS → parental support → students' exposure to school bullying	-0.012**	0.004	-0.015	-0.008
Family ESCS → teacher support → students' exposure to school bullying	-0.010***	0.003	-0.012	-0.008
Total indirect effects	-0.022***	0.005	-0.027	-0.017
*P<0.05, **P<0.01, **P<0.001				

and economic welfare in adulthood (Brown et al., 2008). As a result, students from disadvantaged families in the four provinces of China may not enjoy equal opportunities to flourish due to an increased exposure to school bullying.

We identify the mechanism by which family ESCS influences students' exposure to school bullying: family ESCS indirectly impacted students' exposure to school bullying through its effect on parental and teacher support available to students. Specifically, family ESCS inequality leads to inequality in levels of parental support and teacher support, which further created inequality of students' being bullied. In terms of the mediating role of parental support, parents from families with higher ESCS tend to have higher educational levels. This may mean they make more conscious efforts to get involved in their children's education and development and are more willing to communicate with their children to help solve the learning and living problems their children confront (Lereya et al., 2013). Caring and supportive ties between parents and children are conducive to the development of students' academic adaptability and social skills and thus can protect students from being bullied (Rivara et al., 2016). In contrast, parents from families with lower ESCS have limited resources, capabilities, and time and thus may be less able to provide their children with timely and effective help when their children face difficulties, making these students more likely to be bullied. In terms of the mediating role of parental support, parents from families with higher ESCS can mobilize more social and cultural resources to become better involved in their child's school educational activities and can actively build cooperative relations with teachers, which will help their children get more support from teachers (McNeal et al., 1999). Support from teachers helps students gain peer acceptance and enhance their social competency, which can reduce students' exposure to school bullying (Troop-Gordon et al., 2011). In contrast, parents from families with lower ESCS lack the relevant resources and capabilities to create a favorable external developmental environment for their children, making these students more likely to be bullied.

Implications

In light of the discussion above, the following recommendations are offered.

First, China should continue to improve its system of school bullying prevention and treatment to reduce bullying victimization among students from disadvantaged backgrounds. School bullying prevention and treatment has become a major concern for the country's policy-makers. To promote the implementation of effective school bullying prevention and treatment initiatives, China should continue to improve its system of school bullying prevention and treatment to comprehensively tackle all forms of school bullying and to guarantee that all students have equal and sufficient opportunities for healthy physical and mental development. For students in schools within Beijing, Shanghai, Jiangsu, and Guangdong provinces, family ESCS inequality resulted in students from disadvantaged families experiencing disproportionately more bullying. Therefore, while formulating the school bullying prevention and treatment policy, the country should give more policy support to students from disadvantaged ESCS families. Likewise, educational authorities should invest more resources and professional support in rural schools, disadvantaged schools, and migrant schools that have higher proportions of students from disadvantaged family backgrounds and should help these schools build up their bullying prevention and treatment system to reduce the risk of school bullying in disadvantaged students.

Second, parents in disadvantaged families should give more support and care to their children to enhance their abilities to resist bullying victimization. The role of parents in helping students counteract school bullying is critically important (Liao et al., 2017). However, parents from families with lower ESCS often cannot offer such help, care, and support to their children, leaving their children exposed to bullying victimization. In this study, we propose that even though parents of disadvantaged families may lack the corresponding resources and capabilities to provide their children with a better developmental environment, they can still be actively involved in their children's education, pay more attention to their children's mental and behavioral development, and improve the parent-child relationship through increased close communication and interaction to help their offspring cope with difficulties in learning, living and peer interaction and to protect them from the harmful effects of being bullied. We suggest that parents make a conscious effort to learn how to prevent and treat school bullying and to help their children recognize school bullying and make appropriate responses. In addition, parents who find that their children have been exposed to school bullying should seek the support of communities and schools to help these students overcome bullying victimization.

Third, teachers should treat students fairly and guide students to socialize with their peers appropriately. Teachers are a valuable resource that students can rely on for help with school bullying. The help and care teachers give to students is conducive to broadening student-teacher communication channels and building positive student-teacher relations. This enables students to actively seek their teachers' support when in need and helps student get the acceptance and recognition of peers. In this study, we found that the teacher support that students receive varied for students from different

family backgrounds, such that students with higher family ESCS have a lower risk of being bullied and students with lower family ESCS have a higher risk of being bullied. To reduce exposure to school bullying for all students, we suggest that teachers treat students fairly, analyze the behavioral and mental progress of their students, and provide timely help and support to students facing learning, living and socializing difficulties. Additionally, teachers can help students cultivate good conduct, such as being friendly and helpful, and respecting others, and can guide students to socialize with their peers appropriately so that students from disadvantaged family backgrounds better integrate themselves into their peer group.

Notes

1. *In the first stage of sampling, PISA employed probability proportional to size (PPS) to select sample schools. In the second stage of sampling, PISA randomly selected students from sample schools.*
2. *For a path analysis model with continuous and categorical variables, model fit is acceptable if the weighted root mean-square residual (WRMR) is less than 0.9. For more detail, please refer to Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: a review. The Journal of Educational Research, 99(6), 323-338.*
3. *Results of the path analysis model estimate the correlation coefficient between parental support and teacher support as 0.150 ($P < 0.001$). This result was not included in Table 3.*

References

Analitis, F., Velderman, M. K., Ravenssieberer, U., Detmar, S., Erhart, M., & Herdman, M., et al. (2009) Being bullied: associated factors in children and adolescents 8 to 18 years old in 11 european countries. Pediatrics; 123(2):569-577.

Brown, S., & Taylor, K. (2008) Bullying, education and earnings: evidence from the national child development study. Econ Edu Rev; 27(4):387-401.

Delprato, M., Akyeampong, K., & Dunne, M. (2017) The impact of bullying on students' learning in Latin America: a matching approach for 15 countries. Int J Edu Dev; 52:37-57.

Due, P., Merlo, J., Harelfisch, Y., Damsgaard, M. T., Soc, M.S. , & Holstein B.E., et al. (2009) Socioeconomic inequality in exposure to bullying during adolescence: a comparative, cross-sectional, multilevel study in 35 countries. Am J Pub Health; 99(5):907-914.

Hayes, & Andrew, F.. (2009) Beyond baron and kenny: statistical mediation analysis in the new millennium. Commun Monograph; 76(4):408-420.

Jansen, D.E., Veenstra R., Ormel, J., Verhulst, F.C., & Reijneveld, S.A.. (2011) Early risk factors for being a bully, victim, or bully/victim in late elementary and early secondary education. the longitudinal trails study. BMC Pub Health; 11(1):440.

Kaltiala-Heino, R., Rimpel, M., Rantanen, P., & Rimpel, A. (2000) Bullying at school—an indicator of adolescents at risk for mental disorders. J Adolesc; 23(6):661-674.

Lereya, S.T., Samara, M., & Wolke, D. (2013) Parenting behavior and the risk of becoming a victim and a bully/victim: a meta-analysis study. Child Abus Negl; 37(12):1091-1108.

Liao, J.X., Jin, Y.L. (2017) The prevention of the American school bullying: history, experience and enlightenment. Edu Sci; 33(5):89-96.

Maynard, B.R., Vaughn, M.G., Salaswright, C.P., & Vaughn, S.R. (2016) Bullying victimization among school-aged immigrant youth in

the united states. J Adol Health Offic Pub Soc Adol Med; 58(3):337-344.
McNeal Jr, R.B., & Ralph, B. (1999) Parental involvement as social capital: differential effectiveness on science achievement, truancy, and dropping out. Soc Forc; 78(1):117-144.
OECD (2016) PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematics and Financial Literacy, PISA, OECD Publishing, Paris.
OECD (2017) PISA 2015 Results (Volume III): Students' Well-Being, PISA, OECD Publishing, Paris.
OECD (2009) PISA data analysis manual: SPSS, second edition. PISA, OECD Publishing: 72-74.
Olweus, D. (1994) Bullying at school: basic facts and effects of a school based intervention program. J Child Psychol Psych, 35(7):1171-1190.
Rivara, F., & Le Menestrel, S. (2016) Preventing Bullying Through Science, Policy, and Practice. Washington, DC: The National Academies Press.
Smith, P. & Morita, Y., Junger-Tas, J., Olweus, D., Catalano R.F., & Slee, P. (1999) The Nature of School Bullying: A Cross National Perspective. London, United Kingdom: Routledge.
Troop-Gordon, W., & Kopp, J. (2011) Teacher–child relationship quality and children's peer victimization and aggressive behavior in late childhood. Soc Dev; 20(3):536-561.
Wang, M.C. (2014) Latent variable modeling using Mplus. Chongqing, P.R.China: Chongqing University Press, 77.
Wang, W.D. (2016) How much school bullying that should not have occurred? Guangming Daily. Retrieved September 10, 2017 from http://news.gmw.cn/2016-12/15/content_23265749.htm.
Woods, S., & Wolke, D. (2004). Direct and relational bullying among primary school children and academic achievement. J Sch Psychol; 42(2):135-155.

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ARTICLE

An Empirical Study on the Influence of School Choice on Junior Middle School Students' Academic Performance

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Abstract. Using data from 17,424 junior middle school student responses in the Chinese Education Panel Survey 2014 (CEPS 2014), this study analyzes the influence of school choice on the academic performance of primary to junior students. The results show that students whose families have a higher socioeconomic status and urban students are more likely to choose their school, and that the student's choice of school does not make an impact on their Chinese, mathematics, foreign language or total academic scores. This indicates that choosing schools does not improve students' academic performance. School choice increases the unequal distribution of high-quality education opportunities and reduces the efficiency of educational resources. Therefore, the government should take measures to allocate quality resources more equitably, to increase the supply of quality education resources and to guide parents and students to choose schools rationally.

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***Conflict of Interests**: None.*

Research Background and Problem

"SCHOOL choice" has always been a factor contributing to unfair educational starts and opportunities in China. According to China's compulsory education law, children and teenagers within the compulsory education age range should attend the school nearby their domicile seat. If parents and children are working or residing in a place other than the domicile, the children's compulsory education should be received in the vicinity of their parents or other legal guardians. However, the development of compulsory education in China has been historically unbalanced and insufficient. High-quality education resources are limited, and families in higher social strata tend to acquire better education resources for their child through school choice, a behavior that increases the stratification perpetuated by education. In China, the government has clearly stated that multiple measures are necessary to resolve the inequities brought about by school choice. Although local governments have introduced various policies and measures to limit school choice, school choice is hardly prohibited. School choice not only brings an economic burden to the family, but also has an impact on the efficiency and fairness of compulsory education (Hu et al., 2008). The fundamental goal of parents and students when choosing a school is to gain a competitive advantage in college entrance examinations by attending a school that provides high quality educational resources and thereby significantly improves the students' academic achievement.

This leads to two questions: What factors affect students' school choice behavior? Can students improve their academic achievement through school choice? Using data from the 2014 China Education Panel Survey, this study analyzes the differences in the likelihood of making a school choice for students with different family backgrounds in China, and then estimates the effect of school choice on the academic achievement of junior high school students.

Data Sources and Variable Descriptions

All data used in this study are from the China Education Panel Survey (CEPS) conducted by the China Survey and data Center (NSRC) in 2014. The survey project selected 112 schools, 438 classes and approximately 20,000 junior middle-school students nationwide as a sample, and respondents in this study. Variables used in this study are described in **Table 1**.

Who is Choosing a School?

School choice is examined by asking parents the multiple choice question: "Has your family done the following things in order to let children go to this school?" **Figure 1** shows that 13.8% of parents seek help from friends, 1.9% give gifts to the leaders concerned, 2.9% pay extra fees, 5.5% buy houses in the school area, 3.1%

Table 1. Description of Variables.

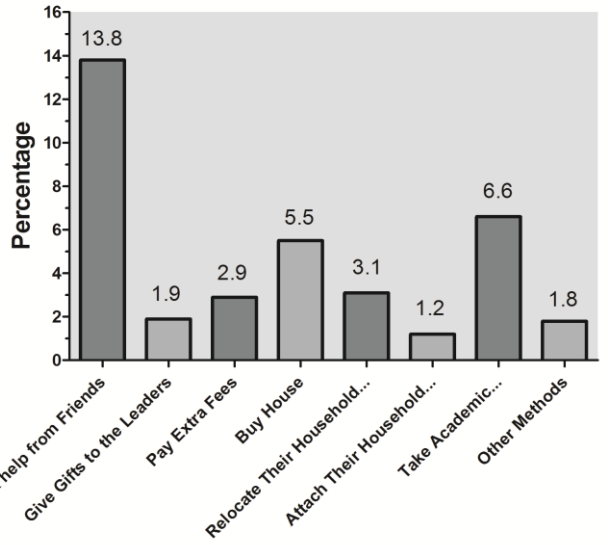
Variable Type	Variable Name	Variable Description
School Choice	School Choice or not	0=No, 1=Yes
Student Academic Achievement	Total Grades	The total grades of Language, Mathematics and Foreign language in the mid-term exam of 2013
	Language Grades	Students' Language Grades in the mid-term examination of 2013
	Mathematics Grades	Students' Mathematics Grades in the mid-term examination of 2013
	Foreign language Grades	Students' Foreign language Grades in the mid-term examination of 2013
Individual Factors	Gender	0= Female, 1=Male
	Only Child or Not	0=No, 1=Yes
	Migrant Child or Not	0=No, 1=Yes
	Household Registration Type	0= Non-agricultural, 1= Agricultural
Family Factors	Parental Education Level *	1.Illiterate/Semi-literate, 2.Elementary School, 3.Junior High School, 4.High School, 5. Junior College, 6. undergraduate, 7. Postgraduate and above
	Parental Occupation Classification †	1. Lower, 2. Middle, 3. Upper
	Family Economic Status	1. Poor, 2. Medium, 3. wealthy
School Factors	School Region	1 = Eastern, 2 = Central, 3 = Western
	School Location	1= Central urban area，2= Urban-rural Junction，3= Rural Area (Including Townships)
	School Ranking	1=Blow the Middle level，2=Middle and above，3=Best

*. Compare the educational level of father and mother and choose the higher one.
†. According to the study of Li Chunling (2010), divide the career of students' parents into upper, middle and lower levels.

relocate their household registration, 1.2% attach their household registration to relatives or friends, 6.6% of parents let their children take all kinds of academic examinations/specialty examinations. In addition, 1.8% of parents choose schools by other methods. Overall, 26.8% of junior high school students enter their school through at least one way of choosing a school, indicating that more than a quarter of junior high school students in China are school-choice students.

In addition, school choice behavior among junior high school students in China differs significantly based on the students' individual, family and school backgrounds. **Table 2** shows that, at the individual level, gender significantly affects school choice behavior. The proportion of males that choose their school is 28.8%, significantly higher than that of females at 24.7%. The proportion of only-children making a school choice is 27.6%, significantly higher than that of non-only children at 26.1%. Significantly more migrant children choose their school than non-migrant children (38.8% compared to 24.1%, respectively). The proportion of non-agricultural household stu-

Figure 1. The Behavior of School Choice in "Primary-to-Junior".



dents choosing their school is significantly higher at 28.5% compared to 25.3% of agricultural household students.

At the family level, the proportion of students choosing their school differs depending on parental educational level. Generally speaking, the higher the educational level of the parents, the greater the proportion of students that choose their school. The proportion of students making a school choice whose parental occupation classification is at the upper level is 31.7%, significantly higher than students whose parental occupation classification is at the middle level (27.3%) and students whose parental occupation classification is at the lower level (20.4%). The proportion of students choosing schools is also significantly affected by family economic status. In students with a wealthy family economic status, 33.9% choose their school, significantly higher than for students with a medium family economic status (26.8%) and students with a poor family economic status (24.5%). In other words, the higher the family economic status is, the greater the proportion of students choosing their school.

At the school level, the proportion of students in schools of their own choosing occurs in the western region, at 31.8%, followed by the eastern region at 27.6%, and the central region has the lowest proportion at 18.9%. There are significant differences in the proportion of students choosing schools in different regions. The highest proportion of students choosing their school is 31.8% in central urban areas, followed by 28.3% in the urban-rural junctions, and 20.3% in rural areas (including townships). The proportion of students who ranked below the middle level (25.3%) or in the middle and above

Table 2. Differences in School Choice Scale of Students.

Variable		School Choice Ratio	Chi-Square Test
Gender	Female	24.7%	x^2=39.315 p<0.001
	Male	28.8%	
Only Child or Not	No	26.1%	x^2= 4.836 p=0.028
	Yes	27.6%	
Migrant Child or Not	No	24.1%	x^2= 291.668 p<0.001
	Yes	38.8%	
Household Registration Type	Non-agricultural	28.5%	x^2= 23.467 p<0.001
	Agricultural	25.3%	
Parental Education Level	Illiterate/semi-illiterate	30.4%	x^2=42.856 p<0.001
	Elementary School	25.4%	
	Junior High School	25.5%	
	High School	26.5%	
	Junior College	31.1%	
	Undergraduate	31.1%	
	Postgraduate and above	31.0%	
Parental Occupation Classification	Lower	20.4%	x^2= 142.519 p<0.001
	Middle	27.3%	
	Upper	31.7%	
Family Economic Status	Poor	24.5%	x^2= 38.440 p<0.001
	Medium	26.8%	
	Wealthy	33.9%	
School Region	Eastern	27.6%	x^2=186.044 p<0.001
	Central	18.9%	
	Western	31.8%	
School area	Central Urban Area	31.8%	x^2=242.029 p<0.001
	Urban-rural Junction	28.3%	
	Rural Area (Including Townships)	20.3%	
School Ranking	Below the middle level	25.3%	x^2=104.559 p<0.001
	Middle and Above	24.9%	
	Best	32.9%	

level (24.9%), are similar but are significantly smaller than the proportion of students choosing their school who ranked best (32.9%).

What Factors Affect Students' School Choice?

To explore the factors affecting students' school choice, we analyzed the factors that influence a student's decision to choose a school at the level of the individual, family and school:

$$Y1 = f(I,F,S) \qquad (1)$$

In model (1), Y1 represents whether students choose their school, a dichotomous variable. If students have at least one school choice behavior at the beginning of ele-

mentary school, they are assigned a value of 1; otherwise they are assigned a value of 0. I represents the individual factors of students, including student gender, whether they are an only child, whether they are migrant children and the type of household registration. F represents student family factors, including parental educational level, parental occupation classification and family economic status. S represents school factors, including school region, school location and school ranking.

In the specific analysis, a logistic regression model is used to explore the factors affecting whether students choose a school. **Table 3** shows that after controlling for other factors, the probability of school choice is significantly lower in females than in males. Similarly, an only child is less likely to make a school choice than the non-only child. The probability of migrant children choosing their school is significantly higher than that of non-migrant children. Children with parents that had a higher occupation classification were more likely to make a school choice. In addition, controlling for other factors, the probability of choosing a school is significantly higher in the western compared to the eastern region, and in the eastern compared to the central region. The probability of students choosing their school in central urban areas and in urban-rural junction areas is significantly higher than that of students in rural area (including townships) choosing their school. School ranking has a significant positive impact on students' school choice. In cases of agricultural household registration, parental education level and family economic status have no significant impact on students' school choice.

An Empirical Analysis of the Influence of School Choice on Students' Academic Performance

To analyze the influence of school choice on student achievement, the classical theoretical model of the educational production function established by Hanushek was used to analyze the factors influencing student achievement (Hanushek, 1986). The extended theoretical model is established as follows:

$$Y2 = f\,(Z,I,F,S) \qquad (2)$$

In model (2), Y2 represents student achievement, including language grades, mathematics grades, foreign language grades and total grades. Z represents whether students chose their school. I represents individual student factors, including gender, whether they are only children, whether they are migrant children and household registration type. F represents student family factors, including parental education level, parental occupational classification and family economic status. S represents school factors, including school region, school location and school ranking.

Table 4 shows that when controlling for other factors, school choice has a significant negative effect on students' academic achievement, both for individual subject grades and for total grades; that is, school choice cannot improve students' academic achievement. For both single subject grades and total grades, female students' academic achievement is significantly higher than that of males. The only child's academic

Table 3. Analysis of Factors Affecting Students' School Choice.

Variable	Coefficient	Occurrence Ratio (Exp(B))
Female (referenced against male students)	-0.224*** (0.035)	0.800
Only Child (referenced against non-only child)	-0.127** (0.041)	0.881
Migrant Children (referenced against non-migrant children)	0.626*** (0.046)	1.871
Agricultural Household Registration (referenced against non-agricultural)	0.035 (0.043)	1.036
Parental Education level	-0.013 (0.019)	0.987
Parental occupation Classification	0.156*** (0.033)	1.169
Family Economic Status	0.045 (0.038)	1.046
Central (referenced against Eastern region)	-0.246*** (0.052)	0.782
Western (referenced against Eastern region)	0.221*** (0.042)	1.247
Urban-rural junction (referenced against rural areas (Including townships))	0.252*** (0.049)	1.287
Central urban area (referenced against rural areas (Including townships))	0.361*** (0.052)	1.435
School ranking	0.164*** (0.030)	1.178
Nagelkerke R^2	0.052	
Sample Size	17,424	
Notes: 1. Standard errors are in parentheses. 2. *p<0.05，**p<0.01，***p<0.001.		

achievement is also significantly higher than that of the non-only child. In contrast, migrant children and non-migrant children did not differ significantly in achievement. Besides foreign language, the grades of agricultural household registration students are significantly higher than that of non-agricultural students. The higher the parental education level, the higher the parental occupation classification is and thus the better the financial status of the family is; this results in better student academic achievement. The language and foreign language grades of students in urban-rural junctions are significantly higher than those in rural areas (including townships), but do not differ significantly for other subject grades. Achievements of students in central urban areas are significantly higher than those in rural areas (including townships). The higher the ranking of schools, the better the students' academic achievements are.

Conclusions

Based on data from China Education Panel Survey done in 2014, this study analyzes differences in the proportion of students making a school choice at the primary-to-junior levels and its influence on subsequent academic achievement. The main conclusions are as follows.

Table 4. The Results of Analysis on The Influence of School Choice on Junior Middle School Students' Academic Performance.

Variable	Model 1: language grades	Model 2: mathematics grades	Model 3: foreign language grades	Model 4: Total grades
School choice	-1.738*** (0.333)	-2.318*** (0.526)	-1.794*** (0.479)	-5.858*** (1.185)
Female (referenced against male students)	7.986*** (0.290)	3.483*** (0.459)	13.042*** (0.417)	24.229*** (1.033)
Only Child (referenced against non-only child)	2.589*** (0.339)	3.807*** (0.536)	4.589*** (0.487)	10.849*** (1.207)
Migrant Children (referenced against non-migrant children)	1.091** (0.410)	0.270 (0.648)	1.074 (0.590)	2.401 (1.461)
Agricultural Household Registration (referenced against non-agricultural)	1.627*** (0.351)	1.949*** (0.554)	0.723 (0.504)	4.193*** (1.250)
Parental Education level	1.831*** (0.157)	3.643*** (0.248)	3.650*** (0.226)	9.134*** (0.560)
Parental occupation Classification	1.252*** (0.270)	1.651*** (0.427)	2.427*** (0.388)	5.337*** (0.962)
Family economic status	1.708*** (0.378)	1.008* (0.493)	1.613*** (0.448)	4.310*** (1.110)
Central (referenced against Eastern region)	-0.981* (0.312)	-7.848*** (0.634)	-1.336* (0.577)	-10.130*** (1.429)
Western (referenced against Eastern region)	3.419*** (0.364)	-1.416* (0.575)	8.251*** (0.523)	10.340*** (1.296)
Urban-rural junction (referenced against rural areas (Including townships))	0.858* (0.402)	-0.458 (0.636)	2.269*** (0.578)	2.553 (1.432)
Central urban area (referenced against rural areas (Including townships))	4.438*** (0.430)	4.069*** (0.679)	7.106*** (0.618)	15.711*** (1.530)
School Ranking	2.072*** (0.507)	5.317*** (0.402)	4.465*** (0.365)	11.759*** (0.905)
Adjusted R^2	0.121	0.098	0.184	0.155
Sample Size	17,020	17,012	17,013	16,975

Notes：1. Standard errors are in parentheses. 2. *p<0.05，**p<0.01，***p<0.001.

1. In China, the phenomenon of school choice remains widespread. Among all students surveyed, 26.8% made a school choice. Among these, the proportion choosing a school by power, such as seeking help from friends, was the highest, accounting for 13.8% of students surveyed. Other methods of making a school choice were: choosing a school by score, such as relying on study and expertise, accounts for 6.6%; choosing a school by house, such as buying a house in a school district, accounts for 5.5%; choosing school by household, such as relocating household registration, relocating to relatives or friends' home accounts for 4.3%; choosing school by money, such as paying additional expenses, accounts for 2.9%; choosing school by power and money such as giving gifts to leaders accounts for 1.9%; and 1.8% of parents choose schools by other means.

2. The proportion of students choosing their school varies depending on individual, family and school backgrounds. The proportion of males choosing their school is higher than that of females. The proportion of only children choosing their school is higher than that of non-only children. The proportion of migrant children choosing their school is higher than that of non-migrant children. The proportion of agricultural children in a school of their choice is significantly higher than that of non-agricultural children. The better the family's socio-economic status is (parental education level, parental occupation classification, and family economic status), the greater the proportion of students that make a school choice. The proportion of students choosing schools in urban areas is significantly higher than that in rural areas. The proportion of students' choosing schools in the best-ranked schools is higher than the students in the middle and lower schools.

3. Whether students choose their school is mainly influenced by three levels of factors: individual, family and school. When controlling other factors, the probability of school choice for an only child is significantly lower than that of a non-only child. The probability of school choice among migrant children is significantly higher than among non-migrant children. Among family factors, parental occupation classification has a significant positive impact on the likelihood of school choice. Parental education level and family economic status have no significant effects. Among school factors, the probability of school choice of students in urban areas is significantly higher than that of students in rural areas. School ranking has a significant positive impact on the possibility of students choosing school. The higher the school ranks, the higher the probability of students will choose school.

4. Based on the classic theoretical model of educational production function established by Hanushek, the regression model was used to explore the influence of school choice behavior of "primary-to-junior" on students' academic achievement. It was found that after controlling for individual, family, school and other influencing factors, students' choice of school has a significant negative impact on academic achievement. School choice does not improve students' academic achievement.

Discussion

School choice in China is a common phenomenon, and there are profound cultural, educational, economic and political reasons behind it. From the perspective of cultural reasons, China has been deeply influenced by Confucian culture. The concepts of Confucian culture that promote paying more attention to education clearly have an important influence on school choice behavior. From the perspective of education, students decide to choose their school in order to obtain better quality educational resources. At present, China's education system remains dominated by examinations. Students can obtain high-quality educational resources by choosing schools, and then gain advantages in entrance examinations. From an economic standpoint, parents wanting to invest more in their children's education choose a school to gain higher returns. If school choice enables students to receive higher

levels of education in the future and increases the rate of return on education, then it is wise for students to choose their school. Raftery's Maximally Maintained Inequality Hypothesis (MMI) (Raftery & Hout, 1993) and Lucas's Effectively Maintained Inequality (EMI) (Lucas & Samuel, 2001) model provide good explanations of political reasons for school choice. According to MMI theory, when compulsory education is not fully universal, educational opportunities for children from different family strata are different. Parents with higher socio-economic status are always looking for ways to maximize their children's educational opportunities. Only when the demand for education reaches saturation, can the difference in enrollment opportunities between upper and lower status families be reduced. According to EMI theory, when compulsory education is popularized, there is a gap in the quality of education between regions, between urban and rural areas, and between schools. The current unbalanced development of compulsory education in China puts the core of competition not for the opportunity to receive education, but for the quality of education, and school choice is the specific manifestation of this competition. Families with higher socio-economic status choose schools to help their children obtain higher quality education, and thereby help their children to gain advantages in future education and employment. This effectively maintains educational inequality and the family's current social status, as well as the social status of future generations. This also explains why the proportion of students from families with higher socioeconomic status choosing their school is significantly higher than that of students from families with lower socioeconomic status. Compared with rural areas, the education level in urban areas is higher and the differences between schools are larger. As the quality of education has become the core of competition, the proportion of students in urban areas choosing their school is higher than that in rural areas.

Families with higher socio-economic status and students from urban areas are more likely to choose their schools, which show that school choice has the function of social reproduction. To some extent, it also reflects educational inequality and social inequality. In addition, it is a concrete manifestation of the gap between the wealthy and the poor, and the urban and the rural areas. With the popularization of compulsory education, although differences in access to education among children from different classes of families are gradually decreasing, there are still gaps in access to education quality. School choice may lead to differences in students' academic achievement and job opportunities in the future, which consequently maintains society strata and hinders intergenerational mobility.

The main reason students choose their school is to obtain high-quality educational resources and improve their academic performance. However, this study finds that school choice does not improve students' academic achievement, regardless of whether considering a single subject or total grades. High-quality schools may gather excellent teachers and resources, which may affect students' learning attitude and behavior, but this does not have a direct and significant effect on students' academic achievements.

Recommendations

1. The government should take active measures to control school choice behavior and allocate high-quality educational resources more equitably, so that children across all socioeconomic strata can have high-quality educational resources. If school choice behavior continues unchecked, higher quality educational resources will only be available to students from families of higher socioeconomic status. However, the use of high-quality educational resources is inefficient for the higher socio-economic families, which reduces the overall efficiency of the use of educational resources. Therefore, only by regulating school choice behavior can high-quality educational resources play a greater role, thereby improving the overall efficiency of the use of educational resources, the quality of education, and educational equity.

2. The government should increase the supply of high-quality educational resources, alleviate parents' demand for school choice, promote the balanced development of compulsory education effectively, and narrow the quality and condition gap among regions, between urban and rural areas, among schools. The current "school choice fever" is indicative of a shortage of high-quality educational resources, whereby people's demand for quality education is greater than the supply of quality schools. Therefore, the government should continue to increase the number of high-quality schools by means of precise support to reasonably solve the expectations and demands of parents and society for high-quality educational resources, should better integrate educational resources, and should increase support for economically backward areas and weak schools to promote the balanced development of compulsory education and reduce the demand for school choice.

3. The government should guide parents and students from different socio-economic strata in urban and rural areas to treat school choice rationally. In particular, families should be made aware that choosing a particular school does not lead to higher achievement benefits for students. Further, for those areas and families experiencing poor economic conditions, school choice creates a heavier financial burden.

References

Hu, Y. M., Lu, K., & Xue, H.Y. (2008) An Empirical Study on School Choice in Primary and Secondary Schools. J Edu Stud; 2:74-78.

Hanushek, E. A. (1986) The economics of schooling: production and efficiency in public schools. J Econ Lit; 24(3):1141-1177.

Raftery, A. E., & Hout, M. (1993) Maximally maintained inequality: expansion, reform, and opportunity in irish education, 1921-75. Sociol Edu; 66(1):41-62.

Lucas, & Samuel, R. (2001) Effectively maintained inequality: education transitions, track mobility, and social background effects. Am J Sociol; 106(6):1642-1690.

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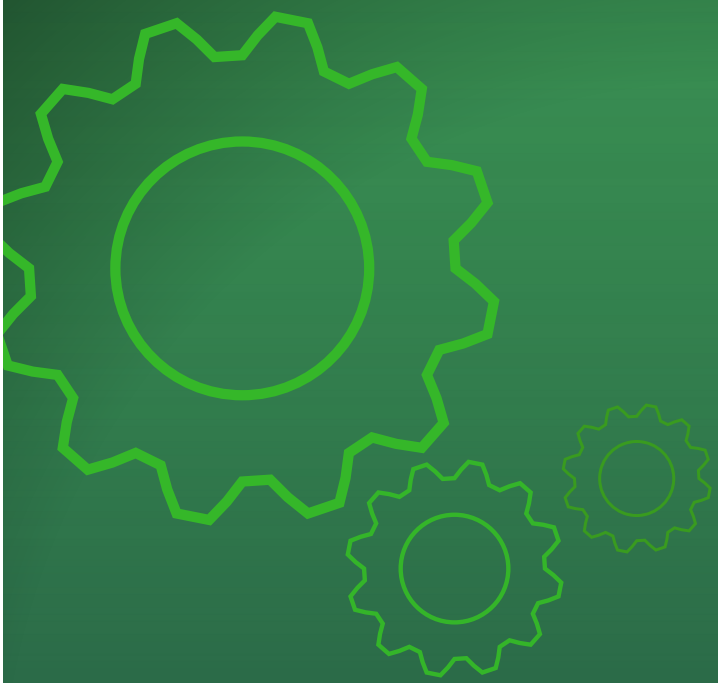

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