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The Rural-Urban Divide: Family Social Capital, Family Cultural Capital, and Educational Outcomes of Chinese Adolescents

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ABSTRACT

A large body of research has been dedicated to the study of relationships between social or cultural capital and educational outcomes in Western countries. However, few studies have examined these associations in a Chinese context, and even fewer have examined the effects of both forms of capital on educational outcomes simultaneously within a familial context in China. This study offers a reformulation of the associations between family social capital and family cultural capital on the educational outcomes of adolescents in both rural and urban China. Using the structural equation modelling approach and the China Education Panel Survey, this study sheds some new insights – the presence of significant compositional differences in both family social capital and family cultural capital between rural and urban Chinese adolescents, and differential effects of both forms of capital on educational outcomes were found. Family social capital presented larger positive effects on the academic effort and educational aspiration of rural adolescents while having no positive effects in facilitating the academic achievement of both rural and urban adolescents. Meanwhile, family cultural capital presented larger positive effects for urban adolescents on all educational outcomes as compared to their rural counterparts.

KEYWORDS

Social capital; Cultural capital; Structural equation modelling; Educational outcome; China

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1. Introduction

Educational attainment is positively related to job opportunities and earnings, and negatively related to the possibility of being unemployed when one enters the labour market. Therefore, it is crucial to understand the factors that may lead to children spending more effort on their education, having higher educational aspirations, and achieving better academic results. These have been topics of research interest for many decades, and the role of family in children's education has been increasingly recognised as an important contributor that cannot be overstated.

While every family aspires for their children to achieve academic success, a significant rural-urban educational gap in China continues to exist. Urban students are found to score 28 points higher on average than rural students in China, as shown in the 2018 Programme for International Student Assessment (PISA) results (Lee, 2022). The rural-urban differences in academic success may be partially attributed to discrepancies in teacher quality, educational resources, or infrastructure between rural and urban China. For instance, in 2019, the proportion of junior high teachers with a college degree is 93% in urban China vs 84% in rural China, while the average value of equipment per student in rural primary schools is only 77.8% of that in urban primary schools, and the figure in rural junior high schools is even lower at 76.4% of that in urban junior high schools (Ministry of Education, 2020). The proportion of primary schools and junior high schools with a local area network (LAN) is also higher in urban China compared to those in rural China (68.7% vs 65.7% for primary schools, and 77.2% vs 74.2% for junior high schools in 2019).

Besides these environmental factors, family involvement in children's education, parent-child relationships, family values and family social networks and connections vary between rural and urban China, which may also be contributing factors to the inequality in rural-urban educational outcomes. A good understanding of the role of family in shaping children's educational outcomes is, therefore, essential for suggesting effective policy measures to narrow the divide between rural and urban children's educational attainment and future labour market performance. The extent to which such rural-urban differences in various forms of family capital has contributed to children's educational outcomes, however, has yet to be explored comprehensively.

1.1. Family Social Capital, Family Cultural Capital, and Education

A large body of research has studied the relationship between social capital and various educational outcomes such as educational attainment (e.g., Chesters & Smith, 2015; Hango, 2007), academic achievement (e.g., Crosnoe, 2004; Dufur, Parcel, & Troutman, 2013), educational aspiration (e.g., Kilpatrick & Abbott-Chapman, 2002; Marjoribanks, 1997; Shahidul, Karim, & Mustari, 2015), school attendance (e.g., Sandefur, Meier, & Campbell, 2006; Smith, Beaulieu, & Seraphine, 1995), dropping out of school (e.g., Smith, Beaulieu, & Israel, 1992) and transitions to higher education (e.g., Kim & Schneider, 2005). Family social capital, defined as social relations among members of a family (e.g., the bonds between parent and child), however, has been less studied so far. Serving as a channel through which human capital and broader resources are transmitted from parents to their children (Schlee, Mullis, & Shriner, 2009), family social capital could be key to children achieving better educational outcomes.

Besides family social capital, the transmission of cultural capital from parents to their children (i.e., family cultural capital) also plays a crucial role in children's educational outcomes, as cultural knowledge and family values equip children at an early age with an understanding of the implicit "rules of the game" within the educational system, an appreciation for higher education, as well as the ability to impress teachers with a presentation of academic brilliance (Bourdieu & Passeron, 1990).

Furthermore, it has been recognised that the effects of both family social capital and family cultural capital on educational outcomes should be examined simultaneously (e.g., Fan, 2014; Khodadady & Zabihi, 2011;

Marjoribanks & Kwok, 1998). This is important as both social capital and cultural capital are present in a family, therefore the estimated effects of one form of capital on educational outcomes would be biased if the other form of capital were not controlled for.

However, although many studies have identified positive associations of social capital and cultural capital with educational outcomes in Western countries (e.g., De Graaf, De Graaf, & Kraaykamp, 2000; Jæger & Møllegaard, 2017; Kalmijn & Kraaykamp, 1996; Katsillis & Rubinson, 1990; Roscigno & Ainsworth-Darnell, 1999; Tramonte & Willms, 2010), it would be naive to assume that they exert a similar influence on academic success in China, given varying socio-cultural values and education systems across different countries (Mendez, 2015).

Studies that examine the associations of family social capital or family cultural capital with various educational outcomes within the Chinese context have been few and far between (Ma & Wu, 2020; Duan, Guan & Bu, 2018; Wu, Tsang & Ming, 2012). Moreover, findings from the few studies reveal intertwining relationships between family social capital, family cultural capital and various educational outcomes of children in China. For example, Ma and Wu (2020) used data from the China Education Panel Survey (CEPS) for Academic Year 2013-2014 and the structural equation modelling (SEM) approach, and found that rural migrant children had lower family social capital as compared to urban non-migrant children, and the negative effects of migration on children's academic achievement (measured by the mid-term examination marks for English, Mathematics and Chinese) were fully explained by the mediation of family social capital and family cultural capital – specifically, objectified family cultural capital had the largest mediating effect of approximately eight times greater than that of family social capital.

Another study by Duan, Guan and Bu (2018) utilised similar data from the CEPS to investigate how socioeconomic status and parental involvement impacted academic achievement. Their results showed no significant association between home-based involvement and academic achievement, but a significant positive association between academic socialisation and academic achievement was found¹. When socioeconomic status was included in the regression analysis, it was found to have a significant positive effect on academic achievement, and a negatively moderating effect on the relationship between academic socialisation and academic achievement.

A third study by Wu, Tsang and Ming (2012) used a different dataset consisting of 806 students from Grades 7 to 9 from three schools in Beijing and found that higher levels of family social support² were associated with children putting in more effort into their studies and a lower possibility of dropping out, although it had no significant direct effect on children's educational aspiration. Family financial capital³, on the other hand, had a significant positive association with children's educational aspiration, and significant negative associations with children's academic effort and plans on dropping out after secondary school. The authors concluded that family social support remained insufficient in compensating for the structural barriers that impede migrant children's access to higher education.

It is therefore obvious that more studies on China are required to provide a better understanding of the associations between both forms of family capital and the various educational outcomes of Chinese children and adolescents, as well as the differences in the effects of both forms of capital by hukou (household) registration type. Given that hukou type is a social phenomenon unique only to China, it is imperative to consider the full extent to which both forms of family capital differ because of this institutional mechanism, and the effects this brings about

¹ Parental involvement was categorised into home-based involvement and academic socialisation. Home-based involvement was measured by parents checking up on their children's homework, parents' discussions with their children on relationships with friends, teachers and things that happened in school, and parents reading books together with their children. Academic socialisation was measured by a composite variable comprising parents' educational expectation for their child and their confidence about their child's future.

² Family social support was measured by family members' willingness to help, make decisions together, provide emotional support, and talk about problems.

³ Family financial capital was measured by a composite variable of monthly household income, number of rooms per person in the household, monthly rent, and type of floor of the apartment.

to the educational experiences and subsequent educational outcomes of Chinese children and adolescents.

1.2. Research Contributions of The Present Study

Taking into consideration the various aspects highlighted, this study aims to address two main research questions: (1) How does family social capital affect the educational outcomes of adolescents (i.e., academic effort, in terms of the amount of time adolescents spend on homework; educational aspiration, in terms of the highest level of education adolescents expect to receive; and academic achievement, in terms of exam marks achieved for English, Mathematics and Chinese) in rural and urban China while controlling for family cultural capital, and do these effects differ for rural and urban adolescents?; (2) How does family cultural capital affect these educational outcomes of adolescents in rural and urban China while controlling for family social capital, and do these effects differ for rural and urban adolescents?

Using a sample of 11,711 students in Grades 7 and 9 from the CEPS and the SEM approach, this study found significant compositional differences in both family social capital and family cultural capital between rural and urban Chinese adolescents, and differential effects of both forms of capital on the educational outcomes of these adolescents. Specifically, family social capital was found to have larger total positive effects on the academic effort and educational aspiration of rural adolescents, while presenting no positive effects on improving the academic achievements of both rural and urban adolescents. Meanwhile, family cultural capital was found to have larger total positive effects for urban adolescents on all educational outcomes as compared to their rural counterparts.

This study makes three contributions to the literature. First, it is one of the few studies which have examined both family social capital and family cultural capital simultaneously when evaluating its effects on the educational outcomes of Chinese adolescents. Second, three educational outcomes in the areas of academic effort, educational aspiration and academic achievement are investigated in a structural way such that the associations between the three outcome variables are also controlled for within the modelling setting via SEM. Lastly, while some studies have examined either family social capital or family cultural capital within the Chinese context, there remains a paucity of studies considering the unique features of hukou (household) registration and the compositional differences as well as the differences in the effects of both forms of capital by hukou type. This study addresses this gap by focusing on the investigation of how and whether the effects of both forms of capital on the educational outcomes of Chinese adolescents differ by hukou type.

The rest of this paper is organised as follows. Section 2 provides some background information on hukou registration in China and explains how it is related to rural-urban educational inequality in Chinese society, as well as compositional differences in family social capital and family cultural capital between hukou types. Section 3 introduces the data and empirical methodology used in this study and Section 4 discusses the results and findings from the empirical analyses. Section 5 concludes.

2. Hukou Registration and Rural-Urban Educational Inequality in Chinese Society

The hukou (household) registration system is a social policy unique to China that has created distinctive social divides since the 1950s. Initially implemented as a system to restrict population growth in cities due to rapid urbanisation, hukou registration, which requires households to be classified as either 'agricultural' (i.e., rural) or 'non-agricultural' (i.e., urban), has significantly contributed to a stratified Chinese society where every individual is automatically assigned a hukou type at birth based on a mother's hukou status (Chan & Zhang, 1999). Particularly within the education system, quality of education, school resources and even school admissions have revolved around one's hukou status and differs greatly for those from rural and urban communities. Hukou status has been found to affect children's educational attainment and the ratios of school transitions to junior and senior high

schools. Children bearing a rural hukou status have been substantially disadvantaged in educational attainment, and the disparity is found to be consistent over time (Wu, 2011). However, the relationship between hukou status and educational attainment remains complex – although one's hukou status plays an important role in determining the likelihood of attaining higher education, education can also be used as the criterion for urban hukou assignment to those originally from rural backgrounds (Wu & Treiman, 2004).

As such, a key concern arising from hukou registration is how families with urban hukou statuses are provided with an advantage over their rural counterparts in accessing better quality and better rewarded types of education, thus reinforcing the intergenerational reproduction of social inequality between rural and urban families. While access to education has been granted for all children under Article 18 of the Education Law of the People's Republic of China (Ministry of Education, 1995), current laws make it difficult for children of rural migrants in the cities from taking the two most important open examinations upon completion of nine years of compulsory education – the 'Senior Secondary Education Entrance Examination' (i.e., Zhongkao) and the 'National Higher Education Entrance Examination' (i.e., Gaokao). As such, overall educational inequality in China has been found to mainly stem from disparities in access to senior high schools between rural and urban areas because of institutional barriers arising from hukou registration (Qian & Smyth, 2008).

Apart from this, with the acceleration of economic growth and reforms in recent decades, large scale rural-urban migration has become commonplace in China, as the lure of promising opportunities draw many from rural communities to the cities. Rural families have thus become compelled to divide in search of better prospects, although this often comes at a price for many. Given that school-age migrant children are not granted equal access to education in the city due to the reluctance of local governments in providing support and funding for the education of migrants (Liang & Chen, 2007), substantial "out-of-pocket" payments are required should migrant parents choose to enroll their children in public schools in the city (Kwong, 2004), often with an incurrence of high educational fees should they actually gain admission (Fleisher & Yang, 2003). There is little alternative for those who are unable to afford the extra costs, with options limited to either: 1) enrolment into informal private schools in the city segregated for the children of migrants only, of which the quality of education has been found to be significantly lower and unregulated (Wang, 2008) even though the tuition fees remain more affordable; or 2) enrolment into rural schools away from working parents. In view that hukou registration comes with complex intertwining implications, it is therefore necessary to examine the extent of these effects on the educational outcomes of adolescents, given that an individual's labour-market return has been found primarily affected by hukou status through its influence on the returns to education (Fu & Ren, 2010).

Where family social capital is concerned, the bonds between parent and child, through parental presence and regular interactions between parents and their children, is crucial for the transmission of this capital and for its subsequent effectiveness in facilitating positive educational outcomes such as academic achievement. However, as this institutional mechanism (i.e., hukou type) continues to limit the income opportunities found in rural communities, rural parents may find themselves short of the luxury of being present at home and engaging with their children often, as income generation takes precedence in day-to-day livelihood. In such instances, the effects that parental absence may have on parent-child bonds and their children's subsequent educational outcomes becomes a cause for concern.

Furthermore, as rural families tend to have more children due to great resistance toward the one-child policy that was rolled out in 1980 and strictly enforced up until 2015 (Zhang, 2017), it must be noted that even if rural parents were able to make time to develop parent-child bonds and engage with their children, having more children would also more likely result in a quality-quantity trade-off in such engagement (Hanushek, 1992; Li, Zhang, & Zhu, 2008). Given the tendency for larger family sizes in rural communities, rural parents may also lower their educational expectations for their children due to the limited financial capacities they may have in providing for

their children's higher education. An alternative explanation for lower educational expectations may be because of parents' lesser regard toward higher education, which in the context of a large rural family, is a less pressing need as compared to contributing to the family's economy upon completion of compulsory education. Moreover, rural parents tend to be less educated formally and may therefore be less involved in their children's educational process and progress, such as helping with their children's homework or reading to or with them, as they may not feel well equipped to do so because of their lower literacy and/or knowledge of the curriculum. In this respect, rural children are unable to gain the benefits that such parental involvement and engagement would normally bring with it (i.e., positive educational outcomes).

Similarly, rural parents may also be less educated culturally due to stratified resource allocation arising from hukou registration. Where family cultural capital is concerned, rural parents may have a limited command of formal languages (i.e., Mandarin Chinese or English) and may therefore place lesser emphasis on the ownership of educational resources due in part to their lack of education and their inability to afford such resources, as well as in understanding how such resources encourage the learning process for children. Besides this, the environment between rural and urban communities are also vastly different – unlike rural communities, urban communities are presented with greater opportunities to actively draw from cultural capital and utilise it (e.g., opportunities for museum visits and learning from/appreciating the exhibits on display), and be recognised or rewarded for it (e.g., urban schools' acknowledgement of museum visits as an extra-curricular school activity). Rural parents may therefore place a lesser regard toward developing family cultural capital, as an appreciation for cultural capital (and matters relating to it) is less valued in rural communities, hence the opportunities for use of such capital within the rural community is thereby reduced, thus perpetuating a cycle of lesser regard toward developing such capital, seeing as there is no substantive use, recognition or reward derived from possession of it to begin with.

Given these circumstances, compositional differences in family social capital and family cultural capital between hukou types are expected. Urban families are more likely to possess a higher capacity to develop both forms of capital and remain in a better position to utilise them in various environments (e.g., schools, peer groups) that would appreciate and reward such utilisation. Meanwhile, children from rural communities may find themselves in a disadvantageous position in both accumulating and utilising these family capitals due to the perpetuation of inequalities in cultural reproduction between rural and urban communities. This therefore necessitates the comparison of the effects that both forms of capital may have on the educational outcomes of rural and urban children resulting from hukou registration in China.

3. Data and Empirical Methodology

3.1. Data and measures

This study uses data from the China Education Panel Survey (CEPS) which is a national, representative, and longitudinal survey starting from Academic Year 2013-2014. It employs a stratified and multistage sampling design with probability proportional to size (PPS) and covers a large sample of approximately 20,000 students (i.e., 7th and 9th graders) from 112 schools in 28 county-level regions in mainland China. The CEPS contains detailed information on students' demographic characteristics, in-school performance, extra-curricular activities, parent-child interactions, relationships with teachers and peers, etc. This study uses the baseline survey, which is publicly available, and keeps observations which have valid information on variables used to measure family social capital, family cultural capital and educational outcomes (in the areas of academic effort, educational aspiration, and academic achievement), as well as control variables of students' demographic characteristics and cognitive ability, resulting in a final sample of 11,711 observations. The variables and their measures will be explained next.

Family Social Capital: In existing literature, two distinct components of family social capital are considered:

structure and process (Smith, Beaulieu, & Seraphine, 1995). The structure component refers to the social setting which facilitates or inhibits interpersonal interactions and access to resources. Within the familial setting, family structure (i.e., absent, single or two-parent households) and the number of siblings are two main characteristics of this component. However, in the context of China, these characteristics are less a function of actual “family social capital” per se than they are a form of a socio-demographic characteristic – family structure has been largely determined and influenced by national policies, such as hukou registration and the one-child policy (Zhang, 2017). Meanwhile, the process component of family social capital refers to the actual interpersonal interactions between parents and their children. This includes parental involvement in their children's educational experience (e.g., homework supervision), parents' nurturing activities (e.g., discussing important issues with their children and reading together), and parents holding high educational aspirations for their children. Therefore, only four observed indicator variables of parental involvement (i.e., parinv), parent-child discussion (i.e., pcdiscussion), parent-child interaction (i.e., pcinteraction), and parental expectation (i.e., parexp), are finally used to measure the latent construct of Family Social Capital in this study.

Family Cultural Capital: Family cultural capital comprises three states of embodied, objectified, and institutionalised cultural capital within the familial context (Bourdieu & Passeron, 1990). Although DiMaggio (1982) proposed using participation in highbrow cultural activities as a measure of cultural capital, other scholars have suggested for this measure to be supplemented with different indicators such as reading habits or literary climate (e.g., De Graaf, De Graaf, & Kraaykamp, 2000), educational resources in the home (e.g., Roscigno & Ainsworth-Darnell, 1999), extracurricular activities (e.g., Covay & Carbonaro, 2010; Kaufman & Gabler, 2004), and the frequency of parents having talks with their children about cultural, social, and political issues (e.g., Jæger, 2009). In the context of China, activities such as going to the museum, watching concerts, or taking arts classes are less useful or even irrelevant when it comes to measuring cultural capital, especially so in rural communities, where such amenities are few in rural areas, and rural families are less equipped to afford such participation. In view of this, the language spoken with parents (i.e., dialect) serves as an observed indicator variable of the embodied state, the variables for owning a desk (i.e., owndesk) and books (i.e., ownbooks) at home serve as observed indicator variables of the objectified state, and the variables for mother's and father's highest level of education (i.e., highedum and higheduf respectively) are used to measure the institutionalised state of family cultural capital. As such, a total of five observed indicator variables are used to measure the latent construct of Family Cultural Capital in this study.

Educational Outcomes: Three educational outcomes in the areas of academic effort, educational aspiration and academic achievement are considered in this study. Academic effort is measured by hours spent on homework assigned by teachers at school in the previous week, while educational aspiration is measured by the highest level of education the student expects himself/herself to receive, and academic achievement is measured by a composite score calculated from the standardised exam marks for English, Mathematics and Chinese obtained during the mid-term of Academic Year 2013-2014.

Group Variable: To compare the compositional differences of family social capital and family cultural capital between rural and urban adolescents, and the effects of both forms of capital on the various educational outcomes of rural and urban adolescents, a group comparison variable is created from students' indication of his or her hukou type.

Control Variables: Control variables that have been taken into consideration include six socio-demographic characteristics, namely students' age, gender, ethnicity, family structure, number of siblings, the financial condition of the family, and students' cognitive ability which is crucial but often omitted in previous studies.

Details on the variable definitions, survey questions that are used to generate the variables and response coding are presented in Table 1. Descriptive statistics for the observed indicator variables of the two latent

constructs Family Social Capital and Family Cultural Capital, as well as the educational outcomes and control variables by hukou type are presented in Table 2.

Table 1. Variable Definitions and Relevant Survey Questions.

Variable	Definition	Survey question	Coded response
Family Social Capital			
<i>parinv</i>	Parental involvement	(1) How often did your parents check up on your homework last week?	0 (<i>Never</i>)
		(2) How often did your parents give instruction on your homework last week?	1 (<i>One or two days</i>) 2 (<i>Three or four days</i>) 3 (<i>Almost every day</i>) * Cronbach's alpha $\alpha = 0.77$
<i>pcdiscussion</i>	Parent-child discussion	(1, 2) How often does your Mother/ your Father discuss things that happened at school with you?	0 (<i>Never</i>)
		(3, 4) How often does your Mother/ your Father discuss the relationship between you and your friends?	1 (<i>Sometimes</i>)
		(5, 6) How often does your Mother/ your Father discuss the relationship between you and your teachers?	2 (<i>Often</i>) * Cronbach's alpha $\alpha = 0.82$
<i>pcinteraction</i>	Parent-child interaction	How often do you read with your parents?	0 (<i>Never</i>) 1 (<i>Once a year</i>) 2 (<i>Once every half year</i>) 3 (<i>Once a month</i>) 4 (<i>Once a week</i>) 5 (<i>More than once a week</i>)
<i>parexp</i>	Parental expectation	What is your parents' requirement on your academic record?	0 (<i>No special requirement</i>) 1 (<i>About the average</i>) 2 (<i>Above the average</i>) 3 (<i>Be one of the top five in class</i>)
Family Cultural Capital			
<i>dialect</i>	Dialect	What language do you usually speak with your parents?	1 (<i>Dialect of my hometown</i>) 2 (<i>Sometimes dialect of my hometown, sometimes Mandarin Chinese</i>) 3 (<i>Mandarin Chinese</i>)
<i>owndesk</i>	Own desk	Do you have a writing desk of your own at home?	0 (<i>No, I don't</i>) 1 (<i>Yes, I do</i>)
<i>ownbooks</i>	Own books	How many books do your family own? (not including textbooks or magazines)	1 (<i>Very few</i>) 2 (<i>Not many</i>) 3 (<i>Some</i>) 4 (<i>Quite a few</i>) 5 (<i>A great number</i>)
<i>highedum</i>	Mother's educational attainment	What is the highest education level your Mother has completed?	0 (<i>None</i>) 1 (<i>Finished elementary school</i>) 2 (<i>Junior high school degree</i>) 3 (<i>Technical / Vocational school degree</i>)
<i>higheduf</i>	Father's educational attainment	What is the highest education level your Father has completed?	4 (<i>Senior high school degree</i>) 5 (<i>Junior college degree</i>) 6 (<i>Bachelor degree</i>) 7 (<i>Master degree or higher</i>)
Educational Outcome			
<i>acadeffort</i>	Academic effort	How much time did you spend on homework assigned by your teachers at school last week?	0 (<i>0 hour</i>) 1 (<i>Less than 1 hour</i>) 2 (<i>About 1-2 hours</i>) 3 (<i>About 2-3 hours</i>) 4 (<i>About 3-4 hours</i>) 5 (<i>About 4-5 hours</i>) 6 (<i>About 5-6 hours</i>) 7 (<i>About 6-7 hours</i>) 8 (<i>About 7-8 hours</i>) 9 (<i>More than 8 hours</i>)
<i>eduasp</i>	Educational	What is the highest level of education you	0 (<i>I don't care</i>)

	<i>aspiration</i>	expect yourself to receive?	1 (<i>Drop out now</i>) 2 (<i>Graduate from junior high school</i>) 3 (<i>Go to technical secondary school or technical school</i>) 4 (<i>Go to vocational high school</i>) 5 (<i>Go to senior high school</i>) 6 (<i>Graduate from junior college</i>) 7 (<i>Get a Bachelor degree</i>) 8 (<i>Get a Master degree</i>) 9 (<i>Get a Doctor degree</i>)
<i>achievement</i>	<i>Academic achievement</i>	Exam marks for English, Mathematics and Chinese obtained during the mid-term of Academic Year 2013-2014	*Standardised to a mean of 70 and standard deviation of 10, and summed into a single score
Control variable			
	<i>Age</i>	Your date of birth is:	YYYY/MM
	<i>Gender</i>	Your sex is:	0 (<i>Male</i>); 1 (<i>Female</i>)
	<i>Ethnicity</i>	Your ethnic nationality is:	0 (<i>Minority</i>); 1 (<i>Han</i>)
	<i>Family structure</i>	Which of the following people live in the same household with you at present?	0 (<i>Other family arrangement</i>) 1 (<i>Child living with both parents</i>)
	<i>Number of siblings</i>	(1) Are you the only child of your family? (2) How many FULL or HALF siblings do you have?	0 (<i>No siblings</i>) to 5 (<i>5 or more siblings</i>)
	<i>Financial condition</i>	Which one of the following best describes the financial conditions of your family at present?	1 (<i>Very poor</i>) 2 (<i>Somewhat poor</i>) 3 (<i>Moderate</i>) 4 (<i>Somewhat rich</i>) 5 (<i>Very rich</i>)
	<i>Cognitive ability</i>	*Standardised scores on a series of comprehensive cognitive competency test questions conducted by the researchers on three dimensions of language, spatial ability, and logic	
	<i>Hukou</i>	What is the type of your <i>Hukou</i> at present?	0 (<i>Agricultural Hukou</i>) 1 (<i>Non-agricultural Hukou</i>)

Table 2. Descriptive Statistics of the Variables.

Variable	Mean	SD	Min	Max
Family Social Capital				
<i>parinv</i>	2.355	2.047	0	6
<i>pcdiscussion</i>	6.208	3.152	0	12
<i>pcinteraction</i>	2.185	2.060	0	5
<i>parexp</i>	2.228	0.879	0	3
Family Cultural Capital				
<i>dialect</i>	2.004	0.823	1	3
<i>owndesk</i>	0.788	0.409	0	1
<i>ownbooks</i>	3.140	1.196	1	5
<i>highedum</i>	2.486	1.519	0	7
<i>higheduf</i>	2.780	1.520	0	7
Educational Outcomes				
<i>acadeffort</i>	5.650	2.517	0	9
<i>eduasp</i>	6.650	1.999	0	9
<i>achievement</i>	212.720	24.783	60.824	286.449
Control variable				
<i>Age</i>	14.914	1.255	12	19
<i>Gender</i>	0.519	0.500	0	1
<i>Ethnicity</i>	0.922	0.268	0	1
<i>Family structure</i>	0.775	0.418	0	1
<i>Number of siblings</i>	0.752	0.804	0	5
<i>Financial condition</i>	2.978	0.538	1	5
<i>Cognitive ability</i>	0.342	0.474	0	1

It is observed from Table 3 that rural adolescents appear to have lesser engagement with their parents regarding homework, discussions on various matters and reading together, as compared with their urban counterparts, although parental expectation of their child's academic record appeared fairly equal for both groups. Likewise, rural adolescents were found to be more likely to converse in dialect with their parents, less likely to have a writing desk of their own at home, have lesser ownership of books and have less educated parents. In addition, rural adolescents were found to fair poorer in the educational outcomes of interest as compared with urban adolescents, although the differences across these educational outcomes between both groups appeared minor. Considering the noticeable differences in composition of both forms of capital by hukou type, further evaluation will be conducted in the following section to determine if these differences are indeed significant between the two groups of adolescents.

Table 3. Descriptive Statistics of the Variables by Hukou Type.

No. of obs.	Urban		Rural	
Variable	Mean	SD	Mean	SD
Family Social Capital				
<i>parinv</i>	2.797	2.127	2.125	1.966
<i>pcdiscussion</i>	6.754	3.136	5.924	3.124
<i>pcinteraction</i>	2.608	2.024	1.965	2.045
<i>parexp</i>	2.243	0.856	2.220	0.891
Family Cultural Capital				
<i>dialect</i>	2.416	0.722	1.791	0.791
<i>owndesk</i>	0.949	0.221	0.704	0.457
<i>ownbooks</i>	3.732	1.057	2.833	1.147
<i>highedum</i>	3.550	1.673	1.933	1.077
<i>higheduf</i>	3.838	1.677	2.230	1.079
Educational Outcomes				
<i>acadeffort</i>	5.924	2.305	5.507	2.609
<i>eduasp</i>	7.081	1.862	6.426	2.031
<i>achievement</i>	214.568	24.184	211.760	25.038
Control variable				
<i>Age</i>	14.693	1.162	15.029	1.286
<i>Gender</i>	0.542	0.498	0.506	0.500
<i>Ethnicity</i>	0.922	0.268	0.922	0.269
<i>Family structure</i>	0.844	0.363	0.739	0.439
<i>Number of siblings</i>	0.348	0.646	0.961	0.798
<i>Financial condition</i>	3.145	0.510	2.891	0.531
<i>Cognitive ability</i>	0.305	0.839	-0.080	0.805

3.2. Empirical Methodology

To evaluate how family social capital and family cultural capital affect various educational outcomes when the socio-demographic characteristics and cognitive ability of students are controlled for, a two-step SEM approach was utilised. The SEM approach is especially well-suited in this study given that the hypothesised model of the effects of both forms of capital on the educational outcomes of Chinese adolescents comprise multiple relationships between the two latent constructs and various outcome and control variables. Compared to traditional multivariate techniques, SEM has three major advantages. First, SEM is designed for use with latent constructs (i.e., constructs that cannot be directly observed, such as Family Social Capital and Family Cultural Capital in this study). Second, SEM allows for simultaneous testing of multiple relationships, and proves especially useful where relationships among explanatory variables and dependent variables are complex and intertwined, as is the case in this study,

where both forms of capital must be considered in their direct and indirect effects on various educational outcomes (e.g., indirect effect on academic achievement via academic effort). Third, SEM provides explicit assessment of measurement errors and unexplained variances, estimating these error variance parameters for both independent and dependent variables at the same time, thus providing a comprehensive analysis into the matter.

In the first step, the measurement models for the two latent constructs, Family Social Capital, and Family Cultural Capital, were tested to see how well-explained these constructs are in predicting the respective observed indicator variables chosen; in the second step, a structural model was tested to examine the multivariate structural relationships (i.e., the direct and indirect paths) among all latent constructs, educational outcomes, and control variables in the model. Model fit is assessed by chi square (χ^2), the Steiger-Lind Root Mean Square Error of Approximation (RMSEA; Steiger, 1990), the Bentler Comparative Fit Index (CFI; Bentler, 1990), and the Standardised Root Mean Square Residual (SRMR). In this study, the model is considered a good fit if RMSEA is smaller than 0.05, CFI greater than 0.95, and SRMR smaller than 0.05, and an acceptable fit if RMSEA is between 0.05 and 0.10, CFI between 0.90 and 0.95, and SRMR between 0.05 and 0.10 (Brown & Moore, 2012; Kline, 2015).

4. Results and discussion

4.1. Measurement Model

Four items (i.e., *parinv*, *pcdiscussion*, *pcinteraction*, and *parexp*) were placed into the confirmatory factor analysis (CFA) model to measure Family Social Capital. Fit indices for rural adolescents are $\chi^2(2) = 46.783$, RMSEA = 0.054, CFI = 0.984, SRMR = 0.016; and those for urban adolescents are $\chi^2(2) = 5.286$, RMSEA = 0.020, CFI = 0.997, SRMR = 0.008, suggesting that the CFA model for Family Social Capital had a good fit for both rural and urban adolescents in China. Similarly, five items (i.e., *dialect*, *owndesk*, *ownbooks*, *highedum*, and *higheduf*) were placed into the CFA model to measure Family Cultural Capital. Fit indices for rural and urban adolescents are $\chi^2(4) = 23.866$, RMSEA = 0.025, CFI = 0.996, SRMR = 0.009, and $\chi^2(4) = 23.828$, RMSEA = 0.035, CFI = 0.994, SRMR = 0.013, respectively, indicating Family Cultural Capital was well represented by the observed indicator variables in both rural and urban China.

4.2. Structural Model

First, two comparison models were tested to compare the differences in the effects of both forms of capital on the educational outcomes of rural and urban adolescents. In a pooled model with no constraints imposed across groups (i.e., all coefficients, including the intercepts, were allowed to differ by hukou type), the model chi-square for Model 1 was statistically significant, $\chi^2(192) = 2410.231$, $p < 0.001$, and values for various fit indices showed that the model had an overall “acceptable fit”, RMSEA = 0.044, CFI = 0.912, SRMR = 0.030. In a pooled model with all constraints imposed across groups (i.e., all coefficients, including the intercepts, were not allowed to differ by hukou type), the model chi-square for Model 2 was statistically significant, $\chi^2(244) = 3017.971$, $p < 0.001$, and values for various fit indices showed that the model had an “acceptable fit” for some indices but slightly less than “acceptable” for others, RMSEA = 0.044, CFI = 0.889, SRMR = 0.044. Using the estimates stored for Models 1 and 2, a likelihood ratio test was conducted to evaluate whether the differences in coefficients across groups were statistically significant and not due to sampling variability. The chi-square statistic for the comparison models was statistically significant, $\chi^2(52) = 607.74$, $p < 0.001$, thus indicating that at least one coefficient (either the effect of the latent constructs, or the intercept or a combination of the three) differed by hukou type.

The structural model was then tested based on hukou type to uncover the differences in the multivariate structural relationships between the four dimensions comprising Family Social Capital, Family Cultural Capital, the

three educational outcomes (i.e., academic effort, educational aspiration, and academic achievement), the six socio-demographic characteristics and the cognitive ability of Chinese adolescents between rural and urban hukou types. A total of 58.6% of the variance in educational outcomes of rural adolescents ($n = 7,707$) was explained by this model, while a total of 52.2% of the variance in educational outcomes of urban adolescents ($n = 4,004$) was explained by this model. The standardised solutions for the structural model for rural Chinese adolescents are presented in Figure 1, while those for urban Chinese adolescents are presented in Figure 2.

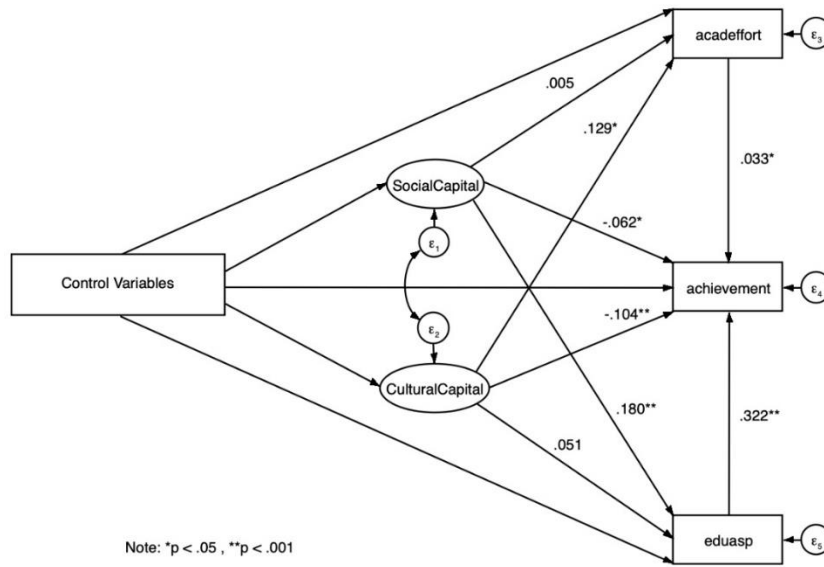


Figure 1. Standardised Solutions for the Effects of Family Social Capital and Family Cultural Capital on the Educational Outcomes of Rural Chinese Adolescents (Agricultural Hukou).

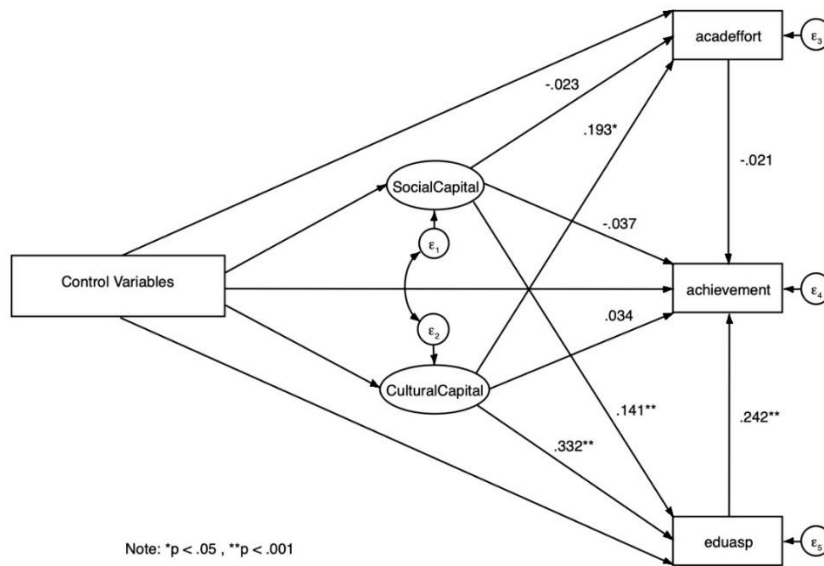


Figure 2. Standardised Solutions for the Effects of Family Social Capital and Family Cultural Capital on the Educational Outcomes of Urban Chinese Adolescents (Non-agricultural Hukou).

The following results were observed from Figure 1 for rural Chinese adolescents. While controlling for the relative effects of family cultural capital, various socio-demographic characteristics and the cognitive ability of rural Chinese adolescents, higher levels of family social capital were significantly associated with higher educational aspiration ($\beta = 0.180, p < 0.001$). However, higher levels of family social capital were also significantly associated

with lower academic achievement ($\beta = -0.062$, $p < 0.05$), while no significant association was found for academic effort ($\beta = 0.005$, $p = 0.918$). In contrast, while controlling for the relative effects of family social capital, various socio-demographic characteristics and the cognitive ability of rural Chinese adolescents, higher levels of family cultural capital were significantly associated with higher academic effort ($\beta = 0.129$, $p < 0.05$). However, higher levels of family cultural capital were also significantly associated with lower academic achievement ($\beta = -0.104$, $p < 0.001$), while no significant association was found for educational aspiration ($\beta = 0.051$, $p = 0.274$).

Meanwhile, from results reported in Figure 2 for urban Chinese adolescents, it was found that while controlling for the relative effects of family cultural capital, various socio-demographic characteristics and the cognitive ability of urban Chinese adolescents, higher levels of family social capital were significantly associated with higher educational aspiration ($\beta = 0.141$, $p < 0.001$). However, no significant associations were found for academic effort ($\beta = -0.023$, $p = 0.638$) and academic achievement ($\beta = -0.037$, $p = 0.188$). In contrast, while controlling for the relative effects of family social capital, various socio-demographic characteristics and the cognitive ability of urban Chinese adolescents, higher levels of family cultural capital were significantly associated with higher academic effort ($\beta = 0.193$, $p < 0.05$) and higher educational aspiration ($\beta = 0.332$, $p < 0.001$), although no significant association was found for academic achievement ($\beta = 0.034$, $p = 0.367$).

Table 4. Standardised Direct, Indirect and Total Effects of Predictor Variables on the Educational Outcomes of Chinese Adolescents by Hukou Type.

Hukou Type	Predictor variables	Academic Effort			Educational Aspiration			Academic Achievement		
		Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Agricultural	Family Social Capital	0.005	no path	0.005	0.180	no path	0.180	-0.062	0.058	-0.004
	Family Cultural Capital	0.129	no path	0.129	0.051	no path	0.051	-0.104	0.021	-0.083
	Age	0.076	-0.019	0.057	-0.045	-0.051	-0.096	-0.027	0.001	-0.026
	Gender	0.103	0.008	0.111	0.102	0.005	0.107	0.218	0.031	0.249
	Ethnicity	-0.042	0.008	-0.034	-0.052	0.006	-0.046	-0.002	-0.023	-0.025
	Cognitive Ability	0.050	0.029	0.079	0.207	0.024	0.231	0.316	0.050	0.366
	Family Structure	-0.020	0.020	0.000	-0.043	0.039	-0.004	0.034	-0.028	0.006
	Number of Siblings	-0.029	-0.033	-0.062	0.048	-0.040	0.008	0.011	0.036	0.047
Financial Condition	-0.061	0.046	-0.015	-0.043	0.029	-0.014	0.009	-0.045	-0.036	
Non-agricultural	Family Social Capital	-0.023	no path	-0.023	0.141	no path	0.141	-0.037	0.035	-0.002
	Family Cultural Capital	0.193	no path	0.193	0.332	no path	0.332	0.034	0.076	0.110
	Age	0.188	-0.021	0.167	-0.060	-0.075	-0.135	-0.017	-0.033	-0.050
	Gender	0.062	0.005	0.067	0.065	0.016	0.081	0.191	0.018	0.209
	Ethnicity	0.003	0.003	0.006	-0.014	0.009	-0.005	-0.025	-0.001	-0.026
	Cognitive Ability	-0.035	0.042	0.007	0.070	0.088	0.158	0.318	0.042	0.360
	Family Structure	0.032	0.016	0.048	0.003	0.060	0.063	0.025	0.011	0.036
	Number of Siblings	-0.026	-0.058	-0.084	0.048	-0.128	-0.080	0.013	-0.022	-0.009
Financial Condition	-0.060	0.060	0.000	-0.066	0.118	0.052	-0.051	0.020	-0.031	

Note: $N = 11,711$; Agricultural ($n = 7,707$) and Non-agricultural ($n = 4,004$).

The standardised direct, indirect and total effects of major predictor variables on the educational outcomes of Chinese adolescents by hukou type are presented in Table 4. The effects of family social capital and family cultural capital on the academic effort, educational aspiration, and academic achievement of Chinese adolescents were found to differ between hukou types. Specifically, family social capital presented larger total positive effects on the academic effort and educational aspiration of rural adolescents as compared to the total positive effects seen for their urban counterparts. Yet, family social capital presented no positive effects in facilitating the academic achievement of both rural and urban adolescents. Conversely, family cultural capital presented larger total positive effects for urban adolescents on all educational outcomes as compared to their rural counterparts. Academic effort and educational aspiration of rural adolescents, while still benefiting from family cultural capital, were found to have much smaller total positive effect sizes. As such, these results highlight how the effects of both forms of capital, though bearing the potential to facilitate positive educational outcomes, may have been hindered by compositional differences of both family social capital and family cultural capital found in rural and urban families. These

differences in composition were thus seen trickling down as differential effects of both forms of capital on the various educational outcomes of rural and urban adolescents, despite controlling for the effects of various socio-demographic characteristics, the cognitive ability of these adolescents and the relative effects of each form of capital in the process.

4.3. Discussion

Significant compositional differences in family social capital and family cultural capital were present across groups of adolescents from agricultural (i.e., rural) and non-agricultural (i.e., urban) hukou types, which were similar to the findings from Ma and Wu (2020). While both forms of capital have presented the potential to facilitate positive educational outcomes for Chinese adolescents (as shown partially in this study and from the results of prior studies), rural adolescents, however, have generally benefitted less from both family social capital and family cultural capital when compared to urban adolescents.

The positive and significant association between family social capital and the educational aspirations of both rural and urban Chinese adolescents may be explained by traditional perceptions or the influence of Confucianism towards education held by Chinese families (i.e., that education is the key to economic success in adult life), which thus influences the relationships between parents and their children, and in turn further influences children's educational aspirations. The non-significant association between family social capital and academic effort found for both rural and urban adolescents run contrary to the findings from Wu, Tsang and Ming (2012). However, this may be related to the measure, 'amount of time spent on homework', which may not be indicative of the true effort students may put into their study – academically inclined students may well spend lesser time on homework and more time on tuition, while those less inclined may spend more time on homework because of a lack of concentration, for example.

Although the direct effects of family social capital on the academic effort and educational aspiration of both rural and urban adolescents were similar, the significant negative association between family social capital and academic achievement for rural adolescents, however, is a cause for concern (a non-significant negative association was found for urban adolescents). This result seems to suggest that family social capital is not important for academic achievement, which goes against the findings of Duan, Guan and Bu (2018) and other prior studies carried out in a Western context, although it must be noted that this study differs from these other studies in that it had also controlled for family cultural capital in the process. This then leads one to speculate that there lies a severe discrimination in the education system against children within rural communities that even family social capital is incapable of mediating.

Likewise, the direct effects of family cultural capital on the academic effort of both rural and urban adolescents were similar (i.e., significant positive associations were found), although this time only a significant positive association between family cultural capital and educational aspiration was found for urban adolescents (a non-significant positive association was found for rural adolescents), and a significant negative association between family cultural capital and academic achievement was found for rural adolescents (a non-significant positive association was found for urban adolescents). These results differ from the findings of Ma and Wu's study (2020), possibly as the authors had excluded the aspect of institutionalised cultural capital in their analyses of family cultural capital. Nonetheless, these findings highlight that the uneven accumulation and transmission of cultural capital between rural and urban families reduces its potential to facilitate positive educational outcomes, especially in environments that have a lesser regard for it (i.e., rural communities). Therefore, with reduced family cultural capital to begin with, rural families find themselves in a perpetuated "vicious" cycle of having lesser cultural capital for transmission to their children (apart from it being less valued within the environment), thereby its (potential) effects become less rewarded by the very same environment that requires it to facilitate positive educational

outcomes.

Furthermore, these findings have some implications for the disparities in educational outcomes of Chinese adolescents, which have long been attributed to the constraints within the Chinese education system. Results suggest that it may also be attributed to the differences in the amounts of family social capital and family cultural capital arising inevitably as a result of institutional structures (i.e., hukou registration) and population policies affecting families (e.g., one-child policy). These social barriers imposed within Chinese society continue to inhibit family interactions and family resources necessary for facilitating the positive educational trajectories of Chinese adolescents. As a result, the true potential that both forms of capital possess in facilitating positive educational outcomes cannot be realised across all families in Chinese society. In this respect, until these barriers are fully abolished, the playing field within education and society at large will remain unlevelled, and disparities within Chinese society will continue to persist between rural and urban communities.

A comprehensive set of policy measures in the education sector, social welfare sector, and economic development sector are therefore needed to make up for the relatively low levels of family social capital and family cultural capital among children of agricultural hukou (i.e., rural children). First, policymakers in the education sector may provide additional resources and support to children of agricultural hukou in schools (such as providing after-school student care centres, book donation campaigns, etc) to ensure the educational process is more inclusive and equal for rural children. Second, the social welfare sector may work towards the creation of a strong social support network for this group of children, offering services from financial assistance, healthcare, and mental wellbeing checks, which would effectively leave no one behind in the educational process. Lastly, policymakers in the economic development sector may provide incentives and opportunities for rural families to work and live in their place of hukou registration by creating more job opportunities and a better business ecosystem in rural areas to reduce disparities in family social capital and family cultural capital right at the root cause. When carried out together, these proposed measures should work to promote better educational outcomes for the children of agricultural hukou by achieving greater equality among all children, regardless of their registered hukou types.

5. Conclusion

The present study attempted to minimise the influences of other competing factors so that any differences in the associations found between family social capital, family cultural capital and the various educational outcomes could then be, more likely although not exclusively, attributed to the “actual” effects of each form of capital on various educational outcomes. The effects of each form of capital, various socio-demographic characteristics, and the cognitive ability of Chinese adolescents on the three different educational outcomes of academic effort, educational aspiration, and academic achievement, were statistically controlled for through structural equation modelling. The inclusion of these controls thus allowed for the unique relationships between family social capital, family cultural capital and the different educational outcomes to be ascertained simultaneously yet separately. As such, all reported findings may be regarded as the “actual” effects of each form of capital on each educational outcome, net of the various socio-demographic characteristics and the cognitive ability of Chinese adolescents.

Results from the SEM analyses examining students from Grades 7 and 9 ($N = 11,711$) from 438 classes at 112 schools in mainland China showed that the effects of family social capital and family cultural capital on the academic effort, educational aspiration and academic achievement of Chinese adolescents differ between hukou types. Family social capital was found to have larger total positive effects on the academic effort and educational aspiration of rural adolescents as compared with the total positive effects seen for their urban counterparts, while presenting no positive effects in facilitating the academic achievement of both rural and urban adolescents. Conversely, family cultural capital was found to have larger total positive effects for urban adolescents on all educational outcomes as compared to their rural counterparts, whose academic effort and educational aspiration, while still benefiting from

family cultural capital, had much smaller total positive effect sizes. These findings suggest that the Western-developed concepts of family social capital and family cultural capital may be applied to the analyses of educational outcomes of adolescents within the Chinese context only to a certain extent, given that the unique social policies governing Chinese society continue to restrict their full applicability because of context dependency.

There are two limitations that are noteworthy in the present study. First, it assumed that the chosen indicators are accurate and sufficient to represent family social capital, family cultural capital, the various educational outcomes, the socio-demographic characteristics, and the cognitive ability of adolescents in Chinese society. Better indicators, if available from other surveys, may be used to test the robustness of the relationships identified in this study. Second, while considerable effort has been made to ensure consistent estimates of the relationships between family social capital, family cultural capital and various educational outcomes through the hypothesised model, there may still be endogeneity issues coming from missing variables and measurement errors due to self-reported values (i.e., financial condition) which cannot be solved using only cross-sectional data. Future work may consider using longitudinal data and policy shocks to identify true causal effects of both forms of capital on various educational outcomes, as well as explore the mechanisms on how family social capital and family cultural capital have influenced educational outcomes differently for different hukou types in China.

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Declaration of Competing Interest

All the authors claim that the manuscript is completely original. The authors also declare no conflict of interest.

Author contributions

Conceptualization: Claire Gek Ling Tan; Investigation: Claire Gek Ling Tan, Zheng Fang; Methodology: Claire Gek Ling Tan, Zheng Fang; Formal analysis: Claire Gek Ling Tan; Writing – original draft: Claire Gek Ling Tan; Writing – review & editing: Claire Gek Ling Tan, Zheng Fang.

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