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Family social and cultural capital: an analysis of effects on adolescents' educational outcomes in China

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Abstract

Using a sample of 11,313 students in Grades 7 and 9 from the China Education Panel Survey, this study examines the effects of family social capital and family cultural capital on adolescents' educational outcomes in the areas of academic effort, educational aspiration, and academic achievement. The results from structural equation modeling analyses showed that family social capital and family cultural capital had significant positive associations with adolescents' educational aspirations. However, only family cultural capital had a significant positive association with academic effort, while family social capital showed a non-significant negative association, and both forms of family capital had significant negative associations with academic achievement.

Keywords: Social capital, Cultural capital, Structural equation modeling, Academic effort, Educational aspiration, Academic achievement, China

JEL Classification: I20, Z13

Introduction

Educational attainment is pivotal in enhancing job prospects and income levels when one enters the labor market. In this regard, education remains a key catalyst for social mobility and improves one's chances of a better life ahead. While access to education remains an important factor in the educational pursuit, there is growing consensus among researchers that family plays a critical role in shaping the educational trajectories of adolescents through the transmission and reproduction of different forms of capital. Recognizing this, many researchers have since delved into assessing the effects of social capital or cultural capital within the familial context on various educational outcomes of adolescents in different national contexts (Byun et al. 2012a, b; Huang and Liang 2016; Shahidul et al. 2015; Tan and Liu 2018). However, such research in contemporary China has received little attention thus far (Liang and Du 2012; Li and Zheng 2016; Wei 2012; Wu et al. 2010; Yu et al. 2022). Furthermore, few studies have attempted to examine both forms of family capital in a single review (Khodadady and Zabihi 2011; Marjoribanks and Kwok 1998), let alone in a context of Chinese families (An 2005; Ding and Wu 2023; Fan 2014).

Examining family social and cultural capital simultaneously is important. As both forms of capital are present within any given family, the relative effects of either form of capital must be accounted for to understand the “true” and “unique” effects on different educational outcomes, net of socio-demographic controls. However, such comprehensive analyses have been lacking thus far, and analyses that have failed to consider both forms of family capital in one review may be subject to bias. As identified in the sociological literature by Bourdieu (1986) and Coleman (1988), the idea of cultural capital becomes entwined with that of social capital when relationships between individuals are invoked. Furthermore, certain studies have also conflated the measures of both forms of family capital. For instance, Tramonte and Willms (2010) proposed the concept of relational cultural capital, which has indicators that were conflated with those of family social capital. Similarly, Crosnoe (2004) introduced the notion of the family conduit of social capital, which has been loosely defined and lacks clear differentiation.

In an attempt to fill this gap in the educational research arena, this study carefully considers the indicators used in the measures of family social capital and family cultural capital within the Chinese context. It analyzes the effects of both types of family capital on three educational outcomes: academic effort, educational aspiration, and academic achievement. Using the structural equation modeling (SEM) approach on a large sample of students in grades 7 and 9 from the China Education Panel Survey (CEPS), this study brings three novel contributions to the literature. First, it is one of the few studies dedicated to providing a holistic view of the intertwining associations between both family social capital and family cultural capital and the educational outcomes of Chinese adolescents. It is achieved by adopting a structured evaluation of the associations between both forms of family capital with three specific educational outcomes, such that all possible associations, including the various sociodemographic characteristics and the cognitive ability of Chinese adolescents, are also controlled for within the modeling setting via SEM. Earlier studies have tended to examine these separately or with smaller samples, and relatively few studies have been conducted within a Chinese context.

Second, this study has been careful in using only observed indicator variables relevant to Chinese society for analyses, while ensuring that the theoretical concepts of family social capital and family cultural capital are not compromised in their operationalized measurements. Different from the extant literature, this study excludes the dimensions of family structure and number of siblings as a component of family social capital, as first proposed by Coleman (1988), and the use of highbrow cultural activities as a form of embodied cultural capital, as first proposed by DiMaggio (1982). This targeted exclusion is taken into careful consideration—it must be acknowledged that family compositions in China have been largely determined and influenced by national policies such as the *hukou* (household) registration and the one-child policy that was rolled out in the 1980s and strictly enforced until 2015 (Zhang 2017). As such, family structure and number of siblings are less a function of actual “family social capital” per se and would serve better as sociodemographic characteristics, at least when evaluated in a Chinese context. Similarly, although earlier quantitative studies (De Graaf et al. 2000; Katsillis and Rubinson 1990) have frequently used children’s or parents’ participation in highbrow cultural activities such as going to the museum or concerts or taking art classes as measures of embodied cultural capital, this is less useful within the Chinese context. Given

the distinct segregation between rural and urban families in terms of household income and geographical accessibility, an indicator reflecting such highbrow cultural activities presents a strong bias against the socioeconomic environment in rural China, where such amenities are few and far between, and rural families are less equipped to afford such participation. Therefore, in reviewing cultural capital, highbrow cultural activities are less a function of actual “embodied cultural capital” per se when being evaluated in a Chinese context.

Finally, this study simultaneously considers the effects of family social and cultural capital on the three educational outcomes—academic effort, educational aspiration, and academic achievement. In the literature, much focus has been dedicated to evaluating the effects of either social capital or cultural capital on academic achievement (Dufur et al. 2013; Israel et al. 2001; Khodadady and Zabihi 2011), as the study of academic achievement is an empirically grounded research tradition that has influenced the field of educational sociology. However, it should be noted that two other educational outcomes, academic effort and educational aspiration, which have been less considered in research, may also contribute to successful educational attainment. A global economic powerhouse such as China would benefit from having a good understanding of the role that family plays in shaping the various educational outcomes of adolescents, especially when such understanding may be translated into developing more effective policy measures to facilitate the educational attainment and future labor market performance of the generations to come.

The rest of the paper is organized as follows. Sect. “[Literature review](#)” reviews the theoretical background and relevant literature on family social capital and family cultural capital, as well as their effects on various educational outcomes in different national contexts. Furthermore, it examines the measures of both forms of family capital used in prior research and specific studies analyzing them in a Chinese context. Data and measurements are explained in Sect. “[Data and measures](#)”, while empirical methods are introduced in Sect. “[Empirical strategy](#)”. Sect. “[Results](#)” discusses the results, giving special attention to the analyses and implications of these findings on social and population policies in China. The final section concludes the paper and highlights the limitations of the current research and recommendations for future research within the areas of social capital, cultural capital, and educational outcomes in the context of Chinese families.

Literature review

Family social capital, family cultural capital, and educational outcomes

Family social capital, as first conceptualized by Coleman (1988), refers to the means through which the transmission of parents’ human capital and other resources to their children occurs within the familial setting. This concept has gradually gained prominence as one of the most salient ideas associated with a myriad of educational-related outcomes, such as academic achievement (Dufur et al. 2013; Israel et al. 2001), educational aspiration (Byun et al. 2012a, b; Shahidul et al. 2015), school attendance (Smith et al. 1995), dropping out of school (Smith et al. 1992), and educational transitions to higher education (Kim and Schneider 2005; Sandefur et al. 2006). Coleman (1988) first proposed family structure, the number of siblings within the family, the mother’s expectation of a child entering college, and the frequency of discussions

between parents and children on academic issues as indicators of family social capital. However, some have argued that these indicators remain too broad for testable hypotheses to be developed (Portes 1998).

As such, theoretical developments in the study of family social capital have led to refinements to the concept, with one such notable contribution by Smith and colleagues (1995), who proposed two distinct components within this construct: structure and process. The structure component refers to the social setting that 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 proxies of this dimension. Meanwhile, the process component of family social capital refers to the actual interpersonal interactions between parents and their children. It includes parents' nurturing activities (e.g., discussing important issues with their children), parental involvement in their children's educational experience (e.g., participation in parent-teacher meetings), parents holding high educational aspirations for their children, and parents supervising and monitoring homework. Using these structure and process components of family social capital, some studies (Israel et al. 2001) found strong effects of family social capital on the educational outcomes of children and adolescents, reaffirming the significant role families play in promoting and shaping their children's academic success.

Apart from assessing family social capital and educational outcomes, there is merit in evaluating educational outcomes through Bourdieu's (1986) lens of cultural reproduction for a more holistic evaluation of the "true" effects that families have on the educational outcomes of adolescents. In the process of cultural reproduction, Bourdieu argues that cultural capital is transmitted from parents to their children through exposure to parents' embodied cultural capital (e.g., when children adopt the academic expectations or habits of their parents), objectified cultural capital (e.g., when parents purchase educational resources for their children), and institutionalized cultural capital (e.g., when children have highly educated parents as role models to turn to for advice).

Following this, family cultural capital has motivated much empirical research on educational outcomes, with studies evaluated in a Western context (Andersen and Jæger 2015; Tramonte and Willms 2010; Xu and Hampden-Thompson 2011), a non-Western context (Byun et al. 2012a, b), and even in a comparative context of various nations (Huang and Liang 2016; Tan and Liu 2018). For example, to understand how family cultural capital affects academic success in different contexts, Tan and Liu (2018) used data from 116,508 students who participated in the Programme for International Student Assessment (PISA) in 2012 and compared six Confucian heritage cultures (CHCs) with nine non-Confucian heritage cultures (non-CHCs) on this outcome. Given that what is deemed as embodied cultural capital may vary in different countries, their study focused on examining only objectified and institutionalized cultural capital indicators to enable meaningful comparisons between CHCs and non-CHCs of comparable educational and economic development. Their results showed that cultural capital levels were lower in CHCs than in non-CHCs, and except for educational resources, the relationships between all other cultural capital indicators and achievement were weaker in CHCs than in non-CHCs.

While academic achievement has been evaluated frequently, researchers have also begun exploring other outcome indicators, such as educational aspiration. When relating family social capital and cultural capital with educational aspiration, both forms of family capital have been found to have positive effects on such aspiration (Byun et al. 2012a, b; Shahidul et al. 2015). Educational aspiration has also been found to be positively correlated with academic achievement (Ahuja 2016) and to play a significant role in determining later educational attainment (Bu 2016), although the relationship between educational aspiration and academic achievement has been found to differ across national contexts, i.e., academic achievement was found to be more closely linked to educational aspirations in countries such as Germany than in the United States (Buchmann and Dalton 2002). This aspect has yet to be explored in a Chinese context. As such, a closer examination of the associations between educational aspiration, both forms of family capital and academic achievement becomes warranted.

Likewise, academic effort, as proxied by the amount of time students spend on homework, has been less commonly considered an educational outcome but has been found to be closely related to academic achievement. The amount of time spent on homework was found to account for small but consistent differences between the achievement test scores of public and private school students (Coleman et al. 1982), and homework time had a significant contribution to high school seniors' achievement in grades (Keith 1982). Apart from this, students who are required to do homework were found to have significantly higher retention rates in school and scored better on tests (especially for students who had initially performed poorly in the course), and homework submission in itself was found to have a large positive effect on test performance (Grodner and Rupp 2013). This calls for an assessment of the associations between academic effort, both forms of family capital, and academic achievement in greater detail as well.

Table 1 summarizes some examples of findings from studies on either form of family capital on the educational outcomes of interest in this study.

Measures of family social capital and family cultural capital

Since entering the academic lexicon four decades ago, many scholars have contributed to a rudimentary conceptualization of both social capital and cultural capital. However, there appears to be no commonly agreed-upon measurement of the two constructs to date. In the case of social capital, this is partly due to the multidimensionality of the construct, as well as whether scholars have chosen to focus on the sources, forms, or consequences of social capital. Despite the incongruence in the measurement, an important connection between early and subsequent references to social capital demonstrates that it remains essential for the achievement of desired outcomes and the advancement of individuals in society.

However, family social capital has also been conflated with parenting styles in the literature when discussing parent–child interactions and relationships, although these are two theoretically different concepts with empirically different measures. Parenting style stems from the psychological theory of child development and involves the standards and demands set by parents for their children, as well as their communications with their children (Doepke and Zilibotti 2017). It manifests as distinct styles of parenting that vary based on the level of parents' demand of and responsiveness to their children

Table 1 Findings from studies on family social capital or family cultural capital on educational outcomes

Measure	Outcome	Results	Author(s), (Date)
Family social capital	Educational aspirations	Coming from a two-parent family was associated with higher educational aspirations The number of siblings was not significantly related to educational aspirations Having siblings dropping out of school was associated with lower educational aspirations Family process variables (i.e., parental expectations about college attendance; parent–child discussion on college financing, careers, and work) were significantly and positively related to educational aspirations	Byun et al. (2012a, b)
	Academic achievement	Family social capital was a positive significant predictor of test scores	Dufur et al. (2013)
	Academic achievement	Students living with a single parent earned significantly higher scores than students from other family structures when at lower income levels—no difference was found at middle and higher income levels Number of siblings and number of siblings who had dropped out of high school were significantly and negatively associated with achievement Nurturing activities and monitoring efforts had positive associations with achievement, except for parents checking on homework, which was negatively associated with achievement	Israel et al. (2001)
	Educational aspirations	Family social capital significantly and positively impacts students' educational aspirations	Shahidul et al. (2015)

Table 1 (continued)

Measure	Outcome	Results	Author(s), (Date)
Family cultural capital	Academic achievement (performance in reading literacy)	Parental objectified cultural capital had a positive effect on children's academic achievement	Byun et al. (2012a, b)
	Academic achievement (performance in mathematics and science)	Embodied cultural capital (parental expectation of their children's education) was significantly and positively associated with achievement in all 32 countries Objectified cultural capital (parental possession of books) and institutionalized cultural capital (parental education) were significantly and positively associated with achievement in most countries	Huang and Liang (2016)
	Educational outcomes (reading literacy, sense of belonging at school, and occupational aspirations)	A statistically significant effect of both relational and static capital was found for all three outcomes (i.e., reading literacy, sense of belonging at school, and occupational aspirations), with particularly large effect sizes for relational and static cultural capitals on reading and for relational cultural capital on the sense of belonging at school	Tramonte and Willms (2010)
	Educational performance (reading-literacy assessment scores)	Having high levels of basic home educational resources, more cultural communication with parents, being an active participant in cultural activities, and having works of art and books at home presented with positive effects on reading-assessment scores	Xu and Hampden-Thompson (2011)

Findings from eight studies evaluating either form of family capital on the educational outcomes of interest in this study are summarised

through a display of parental authority and control (Baumrind 1989). Within the two dimensions of demand and responsiveness, constructs in the former involve areas such as direct confrontation, monitoring, intrusive directiveness, and consistent discipline, while those in the latter comprise affective components such as cognitive responsiveness, attachment and bonding, and noncontingent positive reinforcement and reciprocity (Baumrind 1989).

Conversely, social capital is derived from the integration of elements of socialization within sociological theory along with the principle of rational action from neoclassical economic theory. The production of such capital is derived from various social relations, exchanges, and norms that are embedded within different contexts of the family (e.g., parent-child), school (e.g., parent-teacher), and community (e.g., parent-neighbor)

to achieve social goals (Coleman 1988). Where measures of the two concepts are concerned, both may involve the use of similar dimensions such as parental involvement and communication and with similar terminology used for indicators, such as “parent–child interaction” or “parent–child relationship” (Hao and Bonstead-Bruns 1998; Lopez Turley et al. 2010). However, it must be noted that empirically, these measures look at different aspects of the parent–child interaction and relationship continuum. Specifically, parenting styles revolve around orientations of child-rearing practices and prescribe the decision-making process in the parent–child relationship, and such measures are less so about the frequency of interaction as they are about the strength and quality of the interaction and relationship. Family social capital, on the other hand, focuses on the functional aspects of the interaction and relationship, such as parents’ expectations and norms, to facilitate a positive social goal, and dimensions relating to parental involvement and communication in this respect often involve the frequency of such interactions between parents and their children.

Similarly, there has been little consensus within the literature about which operational measures most closely capture the essence of cultural capital. Although DiMaggio (1982) proposed using participation in highbrow cultural activities as a measure of cultural capital, some has criticized this for being too narrow (Lareau and Weininger 2003). As such, various scholars have suggested the addition of other indicators to serve as proxies for the measurement of different dimensions of cultural capital, such as the frequency with which parents discuss cultural, social, and political issues with their children (Downey 1995; Jæger 2009), participation in extracurricular activities (Covay and Carbonaro 2010; Kaufman and Gabler 2004), reading habits or literary climate (De Graaf et al. 2000; Sullivan 2001), linguistic aptitude (Chang 2002; Park and Kim 2010), and home-based educational resources (Downey 1995; Roscigno and Ainsworth-Darnell 1999).

Differing views on these constructs have thus guided research in many directions, with some even conflating measures. Table 2 provides examples of the indicators in the measures of family social capital and family cultural capital that have been utilized in various studies of educational outcomes across different national contexts. With reference to the operationalization of family social capital and family cultural capital in these previous studies and taking the Chinese context into consideration, this study utilizes parental involvement, parent–child discussion, parent–child interaction, and parental expectations to measure the process component of family social capital. With regard to the measure of family cultural capital, dialect (embodied), desk availability and number of books (objectified), and parents’ highest education levels (institutionalized) are used.

Studies in a Chinese context

In taking the social, cultural, and national context into consideration during research, one must note that the social landscape in China is less straightforward in regard to education. The Chinese have long believed that education creates a meritocratic society where the talented can thrive irrespective of social origins. However, the *hukou* (household) registration system, a social policy unique to China that has created distinctive social divides since the 1950s, has had immense implications for students taking both the *Zhongkao* (high-school entrance examination) and *Gaokao* (university entrance examination), which have in turn impacted not only the transition of students from

Table 2 Measures of family social capital and family cultural capital utilised in studies of various educational outcomes

Measure	Indicator	Author(s), (Date)
Family social capital	Structural component—family structure; the number of siblings; the number of siblings who dropped out of high school	Byun et al. (2012a, b)
	Process component—parental expectations about college attendance; parent–child discussion on college financing, careers, and work	
	Parental trust in child; parent–child discussion on various issues; whether parents check on homework; parental attendance at school meetings and events	Dufur et al. (2013)
	Number of parents in the household; the number of siblings; the number of siblings who dropped out of high school	Israel et al. (2001)
	Nurturing activities: parental expectations about college attendance; parent–child discussion on school matters	
	Monitoring efforts: whether parents check on homework; how much parents limit TV viewing; the amount of time the child spends at home alone after school	
	Family composition; the number of siblings	Kim and Schneider (2005)
	Parents' expectations for their children's educational attainment; parents' participation in school programs and number of college visits with children; parent–child ties (i.e., sports-related joint activities; discussion of academic issues; direct parental advice on college choice)	
	Family structure; the number of siblings	Sandefur et al. (2006)
	Parental expectations about college attendance; parent–child discussion on school activities and school matters	
	Parental monitoring efforts	Shahidul et al. (2015)
	Parental attendance at school activities; parental educational expectations of children	
	Parent–child discussion of future career	
Whether the mother works full-time	Smith et al. (1995)	
Number of parents in the household; the number of siblings		
Parental monitoring efforts: whether parents monitor a child's homework or know what the child is doing at all times		
Parental expectations about college attendance		
Family cultural capital	Family cultural possessions: the presence of highbrow cultural objects in the home	Andersen and Jæger (2015)
	Engagement in reading (i.e., the extent to which respondent reads for pleasure)	
	Cultural communications (i.e., frequency of parent–child communication on cultural and political issues)	
Home educational resources—availability of objects in the home used for educational purposes (i.e., dictionary, a quiet place to study, a desk for study, textbooks, number of calculators at home)		
Objectified—availability of classical literature, books of poetry, and works of art at home	Byun et al. (2012a, b)	

Table 2 (continued)

Measure	Indicator	Author(s), (Date)
	Highbrow cultural competence: parents enjoy going to a music concert or art gallery; have a certain artistic style or artist they prefer; have a classical composer that they enjoy listening to; are acquaintances with artists Family activities: parents give advice on what books to read/what music to listen to; do not enjoy watching soap operas; parent–child discussion on movies, plays, and philosophical matters; family enjoys going to movies or watching a play together Linguistic aptitude: parents enjoy reading; know how to use a computer and the internet; converse in English without much difficulty; subscribe to or read English magazines and newspapers	Chang (2002)
	Parental participation in the fine arts (i.e., attending art museums, historical museums, opera or ballet performances, classical music concerts, theatrical performances) Parental reading habits (i.e., regional or historical novels; thrillers; science fiction or war novels; Dutch literature; translated literature; literature in a foreign language)	De Graaf et al. (2000)
	Embodied—Parental expectations of their children's education; parental reading time and reading attitude Objectified—Parental possession of books Institutionalized—Parental education	Huang and Liang (2016)
	Static cultural capital—Number of books at home; frequency of visits to museums or art galleries and attendance at an opera, ballet, classical symphony, or live theatre; frequency with which parents listen to classical music with children; ownership of musical instruments, classical literature, books of poetry and works of art at home Relational cultural capital—parent–child discussion on political and social issues, books, films, or television programs; whether parents spend time just talking with their children; whether children enjoy talking about books with other people or going to a bookstore or library	Tramonte and Willms (2010)
	Children's participation in cultural activities (i.e., children's visits to museums or art galleries and attendance at an opera, ballet, classical symphony, or live theatre) Cultural communication—parent–child discussion on political and social issues; watching TV or films, and listening to classical music with parents Cultural possessions—ownership of works of art, classic literature, and books of poetry at home Home educational resources—having a dictionary, a quiet place to study, a desk for study, textbooks, and calculators at home	Xu & Hampden-Thompson (2011)
	Objectified—availability of instruments, works of art, sports equipment, and encyclopedias at home; art centers near home Embodied—parents enjoy classical music; appreciate works of art; enjoy going to the movies, plays, and musicals; like watching news more than soap operas and entertainment shows; enjoy reading books; know how to use a computer and the internet; like to travel; involved in art-related organizations; go to art exhibitions or music concerts often; communicate in English fluently	Yu and Chung (2012)

Indicators used in the measures of family social capital and family cultural capital in various studies of educational outcomes across different national contexts are summarised

compulsory education into tertiary education but also the educational outcomes of students. Particularly within the education system, quality of education, school resources, and even school admissions have revolved around one's *hukou* status and differ 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 high school and academic senior high school, with those bearing a rural *hukou* status being substantially disadvantaged in educational attainment and the disparity being 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 and Treiman 2004). In this respect, a key concern arising from *hukou* registration is how families with urban *hukou* statuses are given 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. As such, when examining both types of family capital in a Chinese context, it would be necessary to control for the effects of *hukou* registration and school effects.¹

While numerous studies have assessed the relationship between family social capital and family cultural capital individually with various educational outcomes within a Western context, those in a Chinese context remain scarce.² Four studies investigated the effects of family social capital on students' academic performance and achievements (Liang and Du 2012; Li and Zheng 2016; Wei 2012; Wu et al. 2010), and two studies investigated family cultural capital and achievement (Wu et al. 2017; Yu et al. 2022). Table 3 summarizes the findings from these studies.

Three studies by An (2005), Ding and Wu (2023), and Fan (2014) were found to have assessed both forms of family capital on various educational outcomes in China thus far. Using data from the Gansu Survey of Children and Families (GSCF) conducted in 2000 and measures of educational expectations, academic self-confidence, academic effort, and emotions toward school as indicators of children's educational engagement, An (2005) found that family social capital, in the form of frequent communication between parents and their children and parents' attention to their children's activities, was not only conducive to children's educational expectations and academic self-confidence but also promoted academic effort. Similarly, family cultural capital, based on the assessment of ownership of items such as children's books and dictionaries, had a positive effect on children's educational expectations and academic self-confidence. Furthermore, An (2005) found that the net of family background, educational expectations, academic self-confidence, and academic effort had a positive impact on children's academic achievement, while the emotional alienation of children in school had a negative impact on academic achievement. Therefore, children's academic achievement

¹ As rural–urban differences are not the topic of discussion in this paper, a review of how these differences manifest in family social capital and family cultural capital, how they differ by *hukou* type, and their subsequent effects on the educational outcomes of Chinese adolescents can be found in a study by Tan and Fang (2023).

² We acknowledge, however, that there may be a large body of literature written in Chinese that has not been included in the review.

Table 3 Findings from studies on family social capital or family cultural capital on educational outcomes in a Chinese context

Measure	Outcome	Results	Author(s), (Date)
Family social capital	Educational status Academic performance	Using tracking data of primary school students in the rural areas of five western provinces of China, family social capital was positively correlated with the educational statuses and academic outcomes of rural children, net of the social and economic factors of rural families	Liang and Du (2012)
	Academic performance	Using data from the Gansu Survey of Children and Families (GSCF), family social capital (assessed in the form of intergenerational closure) presented no significant effects on students' academic performance in rural families	Li and Zheng (2016)
	Student learning Academic achievement	Using a sample of 266 students from Grades 4 to 6 in a suburban elementary school in China, parent-child communication was found to be the most important factor in promoting student learning, while parental help was not viewed as a useful resource for increasing achievement	Wei (2012)
	Academic achievement	Employing an ecological framework of assessment on a sample of 722 migrant children and their parents in Shanghai, family social capital was positively correlated with student achievement of migrant children	Wu et al.(2010)
Family cultural capital	Academic achievement	Using CEPS data, the positive effect of cultural capital on educational achievements was found to be higher among high socioeconomic (SES) families and students attending good-quality schools	Wu et al. (2017)
	Academic achievement	Using CEPS data, family embodied cultural capital, family objectified cultural capital, and family institutionalized cultural capital were found to have significant positive effects on the academic achievement of junior high school students	Yu et al. (2022)

Four studies were found to have investigated the effects of family social capital on students' academic performance and achievement (Liang and Du 2012; Li and Zheng 2016; Wei 2012; Wu et al. 2010) and two studies on family cultural capital and achievement (Wu et al. 2017; Yu et al. 2022)

was strongly affected by their educational engagement, leading the author to conclude that collectively, family social capital and family cultural capital, indirectly through the impact on children's educational engagement in school, are important factors in children's eventual academic performance.

Meanwhile, Ding and Wu (2023) used data from the CEPS 2013–2014 to assess the impact of family economic capital, family cultural capital, and family social capital on the educational expectations of migrant children. The authors found that family economic capital was negatively correlated with the educational expectations of migrant children, while family objectified and institutionalized cultural capital was positively associated with educational expectations, but embodied cultural capital was found to have a significant negative effect. Family social capital was found to have a significant and positive association, although with a relatively weak influence on educational expectations.

Therefore, migrant children's educational expectations were positively influenced by both family social and cultural capital collectively, highlighting the importance of both forms of family capital in encouraging children to form higher educational expectations.

Finally, Fan (2014) examined the impact of Chinese families' economic, social, and cultural capital on children's access to educational resources by analyzing data collected from the China General Social Survey (CGSS) 2008. Their results indicated that while family economic and social capital had a significant influence on children's access to educational resources, a family's cultural capital was found to have the strongest effect. Specifically, when a father's registered permanent residence was more advantageous and both parents were more highly educated, children generally had higher education degrees. However, when a family had more children, children tended to have less access to educational resources, thereby supporting the quality–quantity trade-off theory of resource dilution within a family when a large family size persists (Hanushek 1992; Downey 1995). Given the limited number of studies on China, it is difficult to draw any concrete and consistent conclusions on how both forms of capital within a familial context truly affect the educational outcomes of adolescents in China. As such, this necessitates further and more careful investigation into the associations between both forms of family capital and various educational outcomes of Chinese adolescents.

Data and measures

Data

The China Education Panel Survey (CEPS) was utilized to empirically assess the effects of family social capital and family cultural capital on the educational outcomes of Chinese adolescents. The CEPS was designed by the National Survey Research Centre (NSRC) at Renmin University of China, along with the academic cooperation of 19 local universities and institutions of the China Social Survey Network (CSSN) system. It is a longitudinal, nationally representative, comprehensive, and reliable dataset that aims to provide insights into individuals' educational outcomes alongside multiple contexts of family, school, community, and society during the life course. The CEPS is expected to last more than 30 years, with a new cohort of students sampled at every 10-year interval. Follow-up surveys are conducted on sampled students annually as they matriculate through junior high school, with subsequent follow-ups conducted only in six specific years after graduation from junior high school (i.e., the 1st, 3rd, 7th, 8th, 17th, and 27th years after graduation).

The CEPS baseline survey (administered in the academic year 2013–2014) employed a multistage sampling strategy, with a probability proportional to size (PPS) sampling method utilized in the primary and secondary stages and a random sampling method utilized in the third stage. The primary stage involved a selection of 28 county-level administrative units across 2,870 counties/districts in mainland China, followed by a secondary stage selection of 4 junior high schools (serving Grade 7 and/or Grade 9) under the geographical jurisdiction of each administrative unit. The third stage involved randomly sampling two classes, each from Grades 7 and 9 from each sampled junior high school, with the final stage including all students from the respective sampled classes who were present on the day the survey was administered. The baseline survey thus comprised 19,487 students from 438 classes at 112 schools. Only variables with

valid data information to be used in this study were kept, which led to a final sample of 11,313 students.

Measures

Family Social Capital is a latent construct comprising four measures of parental involvement, parent–child discussion, parent–child interaction, and parental expectations. Parental involvement is a two-item composite variable created from students' indication of the frequency with which parents were involved in checking up or giving instruction on their homework, with responses coded on a scale of 0 (*Never*), 1 (*One or two days*), 2 (*Three or four days*), and 3 (*Almost every day*), and summed into a single score such that a higher score reflects higher parental involvement. Similarly, parent–child discussion is a six-item composite variable created from students' indication of the frequency with which each parent discussed various matters with them, with responses coded on a scale of 0 (*Never*), 1 (*Sometimes*), and 2 (*Often*), and summed into a single score such that a higher score reflects a higher frequency of parent–child discussion. Cronbach's alpha for parental involvement and parent–child discussion are 0.77 and 0.82, respectively, indicating an acceptable to good level of reliability. Finally, parent–child interaction is a variable created from students' responses to the survey question “*How often do you read with your parents?*” and coded on a scale of 0 (*Never*), 1 (*Once a year*), 2 (*Once every half year*), 3 (*Once a month*), 4 (*Once a week*), and 5 (*More than once a week*), while the parental expectation is created from students' response to the survey question “*What is your parents' requirement of your academic record?*”, and coded on a scale of 0 (*No special requirement*), 1 (*About average*), 2 (*Above average*), and 3 (*Be one of the top five in class*). These four measures served as observed indicator variables of social capital in the familial context, where a higher rating reflects higher family social capital.

Family Cultural Capital is another latent construct that comprises three states of embodied, objectified, and institutionalized cultural capital within the familial context. For the embodied state, dialect is used as a proxy for linguistic aptitude and created from the survey question “*What language do you usually speak with your parents?*” with responses coded on a scale of 1 (*Dialect of my hometown*), 2 (*Sometimes dialect of my hometown, sometimes Mandarin Chinese*), and 3 (*Mandarin Chinese*), such that a higher rating reflects higher embodied cultural capital. For the objectified state, the availability of a personal writing desk at home and the number of books owned by the family (not including textbooks or magazines) served as two observed indicator variables. Whether they had a writing desk of their own at home is a dummy variable where 0 means *No*, and 1 means *Yes*; responses to the number of books owned by the family are coded on a scale of 1 (*Very few*), 2 (*Few*), 3 (*Some*), 4 (*Quite a few*), and 5 (*A great number*). Last, mother's and father's highest education level served as two observed indicator variables of the institutionalized state, with responses coded on a scale of 0 (*None*), 1 (*Finished elementary school*), 2 (*Junior high school degree*), 3 (*Technical/Vocational school degree*), 4 (*Senior high school degree*), 5 (*Junior college degree*), 6 (*Bachelor's degree*), and 7 (*Master's degree or higher*).

Educational Outcomes comprise academic effort, educational aspiration, and academic achievement. Academic effort is created from students' responses to the amount of time spent on homework assigned by their teachers at school across the previous

week and coded on a scale of 0 (0 h), 1 (Less than 1 h), 2 (About 1–2 h), 3 (About 2–3 h), 4 (About 3–4 h), 5 (About 4–5 h), 6 (About 5–6 h), 7 (About 6–7 h), 8 (About 7–8 h), and 9 (More than 8 h). Educational aspiration is created from students' response to the highest level of education he or she expects to receive, with responses coded on a scale of 0 (I don't care), 1 (Drop out now), 2 (Graduate from junior high school), 3 (Go to technical secondary school or technical school), 4 (Go to vocational high school), 5 (Go to senior high school), 6 (Graduate from junior college), 7 (Get a bachelor's degree), 8 (Get a master's degree), and 9 (Get a doctoral degree). Academic achievement is measured using students' exam marks for English, mathematics, and Chinese obtained during the mid-term of academic year 2013–2014. As the scoring system for the mid-term exams differed from school to school, all original scores were standardized to a mean of 70 and a standard deviation of 10. The standardized scores were then summed into a single score such that a higher score reflects higher academic achievement attained by the student.

The control variables included in this study are students' age, gender, ethnicity, family structure, number of siblings, financial condition of the family at present, *hukou* type, and cognitive ability. Gender is a dummy variable where 0 means *Male* and 1 means *Female*; ethnicity is a dummy variable where 0 means *Minority* and 1 means *Han*. Family structure is a dummy variable created from students' indication of whether his or her mother and/or father currently live in the same household, where 0 means *Other family arrangement* and 1 means *Child living with both parents*. Number of siblings is a variable created from a student's response to whether he or she is the only child in the family and how many full or half siblings he or she has, with responses coded on a scale of 0 (*No siblings*) to 5 (*5 or more siblings*). Financial condition is a variable created from a student's indication of his or her father's current occupation, which is used as a proxy for the present financial condition of his or her family, with responses coded on a scale of 1 (*Very poor*), 2 (*Somewhat poor*), 3 (*Moderate*), 4 (*Somewhat rich*), and 5 (*Very rich*).³ *Hukou* is a variable created from students' indication of his or her current type of *hukou* and coded as 0 (*Agricultural Hukou*) and 1 (*Nonagricultural Hukou*). The school variable is further added as the control variable in the models specific to academic achievement, as this particular educational outcome is only comparable within schools.⁴ Last, cognitive ability is created from the scores on a series of comprehensive cognitive competency test questions on three dimensions of language, spatial ability, and logic, with the total composite scores standardized based on the three-parameter logistic (3PL) item response theory (IRT) model so that it better reflects students' "true" ability. Descriptive statistics of the variables are presented in Table 4.

³ We refrain from directly utilizing self-reported family financial conditions as the measure because the responses given by the middle school students lack reliability and are susceptible to measurement errors. Financial conditions, together with the school, are important controls as research indicates that the effects of cultural capital can vary based on the socioeconomic statuses of families and schools (Wu et al. 2017).

⁴ This paper does not consider the effect of school social capital on educational outcomes, as Dufur, Parcel, and Troutman (2013) found that the standardized effect of family social capital is stronger than the effect of school social capital. However, it is noted that school social capital is also one of the contributing factors to educational outcomes of adolescents.

Table 4 Descriptive statistics of the variables

Variable	Mean	SD	Min	Max
Family social capital				
<i>parinv</i>	2.380	2.048	0	6
<i>pcdiscussion</i>	6.251	3.140	0	12
<i>pcinteraction</i>	2.210	2.061	0	5
<i>parexp</i>	2.228	0.875	0	3
Family cultural capital				
<i>dialect</i>	2.007	0.824	1	3
<i>owndesk</i>	0.791	0.407	0	1
<i>ownbooks</i>	3.152	1.193	1	5
<i>highedum</i>	2.498	1.515	0	7
<i>higheduf</i>	2.783	1.516	0	7
Educational outcomes				
<i>acadeffort</i>	5.649	2.508	0	9
<i>eduasp</i>	6.671	1.986	0	9
<i>achievement</i>	212.853	24.643	60.824	276.687
Control variable				
<i>Age</i>	14.902	1.253	12	19
<i>Gender</i>	0.517	0.500	0	1
<i>Ethnicity</i>	0.923	0.266	0	1
<i>Family structure</i>	0.782	0.413	0	1
<i>Number of siblings</i>	0.743	0.796	0	5
<i>Financial condition</i>	2.721	1.394	1	5
<i>Cognitive ability</i>	0.060	0.835	-2.029	2.710
<i>Hukou</i>	0.341	0.474	0	1

Family social capital has four indicators (*parinv*, *pcdiscussion*, *pcinteraction*, *parexp*), family cultural capital has five indicators (*dialect*, *owndesk*, *ownbooks*, *highedum*, *higheduf*), educational outcomes include three variables (*acadeffort*, *eduasp*, *achievement*), and control variables include age, gender, ethnicity, family structure, number of siblings, financial condition, cognitive ability, and hukou

Empirical strategy

The two-step approach to SEM was employed for analyses of the effects of family social capital and family cultural capital on the educational outcomes of Chinese adolescents through 1) confirmatory factor analysis (CFA), where a measurement model was tested to investigate the factor loadings of chosen observed indicator variables to establish how well-explained the respective latent constructs are in predicting the observed indicator variables chosen; and 2) structural analysis, where a structural model was tested to examine the multivariate structural relationships (i.e., the direct and indirect paths) among all latent constructs, outcome variables, and control variables in the hypothesized model. Four indices are utilized to evaluate the goodness of fit of the measurement model: chi-square statistic (χ^2), the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the standardized root mean square residual (SRMR). Browne and Cudeck (1993) proposed that RMSEA values of ≤ 0.05 may be indicative of a “close fit,” values > 0.05 and < 0.08 , an “acceptable fit,” values ≥ 0.08 and < 0.10 , a “mediocre fit,” and values ≥ 0.10 , a “poor fit.” Bentler (1990) proposed that CFI values ≥ 0.90 may be deemed an “acceptable fit” and values ≥ 0.95 a “close fit,” while Hu and Bentler (1995) proposed that SRMR values of ≤ 0.05 may be indicative of a “close fit,” and values > 0.05 and < 0.10 , an “acceptable fit.”

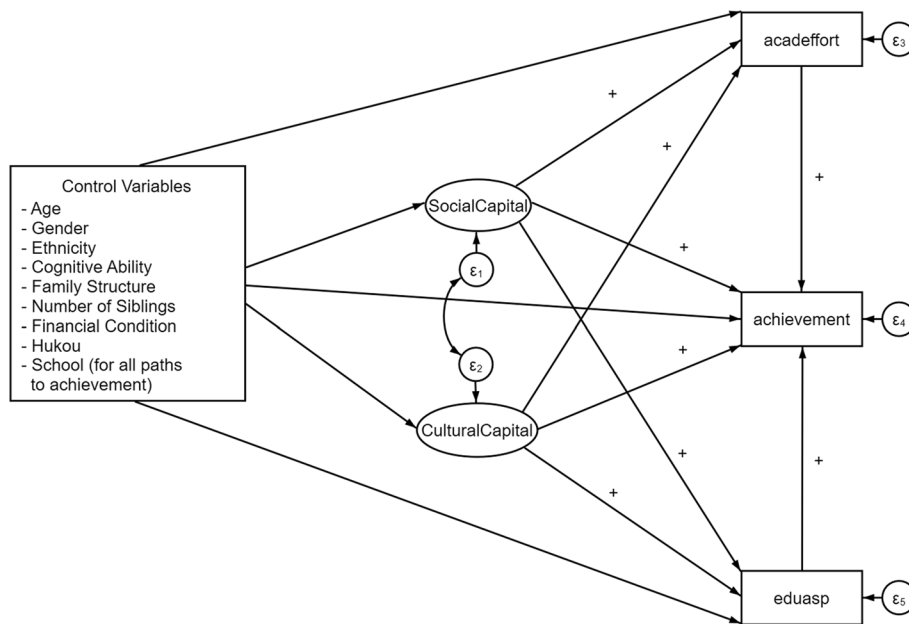


Fig. 1 Hypothesised model of the effects of family social capital and family cultural capital on the educational outcomes of Chinese adolescents. The hypothesis is that family social capital and family cultural capital have positive effects on academic efforts, academic achievement, and educational aspiration. Meanwhile, academic efforts and educational aspiration are positively related with academic achievement

Figure 1 presents the hypothesized model and the expected direct and indirect paths between the latent constructs, *Family Social Capital* and *Family Cultural Capital*, and the three educational outcomes, *Academic Effort*, *Educational Aspiration*, and *Academic Achievement*, while controlling for various sociodemographic characteristics, the cognitive ability of Chinese adolescents, and school effects (for paths to academic achievement only). Although the relationships between both academic effort and educational aspiration with academic achievement are not the focus of this study, given that prior studies have found associations between these two variables and academic achievement (Keith 1982), direct paths from both variables to academic achievement have been included in the hypothesized model to account for these associations during subsequent analyses.

Results

Measurement model

The measurement models of the two latent constructs, *Family Social Capital* and *Family Cultural Capital*, were evaluated via CFA. Four items (*parinv*, *pcdiscussion*, *pcinteraction*, and *parexp*) were placed into the CFA model to measure *Family Social Capital*. The test results of the measurement model for *Family Social Capital* showed an overall acceptable fit with $\chi^2(2) = 40.425$, $RMSEA = 0.041$, $CFI = 0.991$, and $SRMR = 0.015$. Standardized factor loadings ranged from 0.145 to 0.668, with all factors significant at $p < .001$, indicating that this model is well represented by the four indicators (Fig. 2).⁵

⁵ With the exception of parental expectation (i.e., *parexp*), all other factors were found to have met the “minimum acceptable loading” of .30 as proposed by Hair and colleagues (2014).

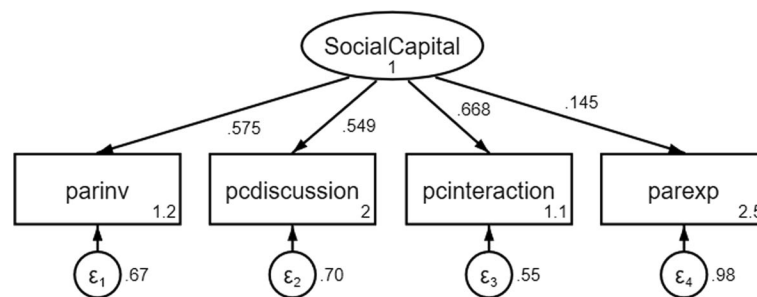


Fig. 2 Measurement model of family social capital. Family social capital is well represented by *parinv*, *pcdiscussion*, *pcinteraction*, and *parexp*

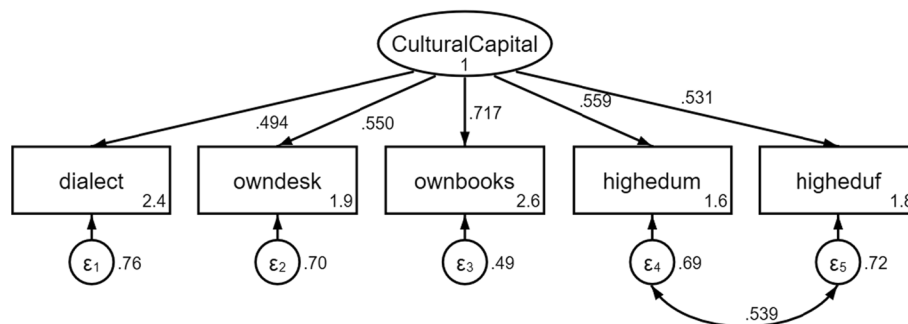


Fig. 3 Measurement model of family cultural capital. Family cultural capital is well represented by *dialect*, *owndesk*, *ownbooks*, *highedum*, and *higheduf*

The measurement model for the latent construct *Family Social Capital* explained an overall 63.7% of the variance in the four observed indicator variables, *parinv*, *pcdiscussion*, *pcinteraction*, and *parexp*.

Similarly, five items (*dialect*, *owndesk*, *ownbooks*, *highedum*, and *higheduf*) were placed into the CFA model to measure *Family Cultural Capital*. Test results of the measurement model of *Family Cultural Capital* showed an overall acceptable fit with $\chi^2(4) = 133.033$, $RMSEA = 0.053$, $CFI = 0.991$, and $SRMR = 0.021$. Standardized factor loadings ranged from 0.494 to 0.717, with all factors significant at $p < .001$, indicating that this model is well represented by the five indicators (Fig. 3). The measurement model for the latent construct *Family Cultural Capital* explained an overall 70.3% of the variance in the five observed indicator variables, *dialect*, *owndesk*, *ownbooks*, *highedum*, and *higheduf*.

Structural model

The hypothesized structural model was tested to uncover the multivariate structural relationships between family social capital, family cultural capital, and the three educational outcomes, while controlling for various sociodemographic characteristics, the cognitive ability of Chinese adolescents, and school effects (for paths to academic achievement). The results indicate that the overall model chi-square was statistically significant, $\chi^2(114) = 4490.383$, $p < 0.001$, and values for various fit indices showed that the structural model had an overall “acceptable fit,” $RMSEA = 0.058$, $CFI = 0.882$, $SRMR = 0.038$. A total of 80.0% of the variance in educational outcomes of Chinese

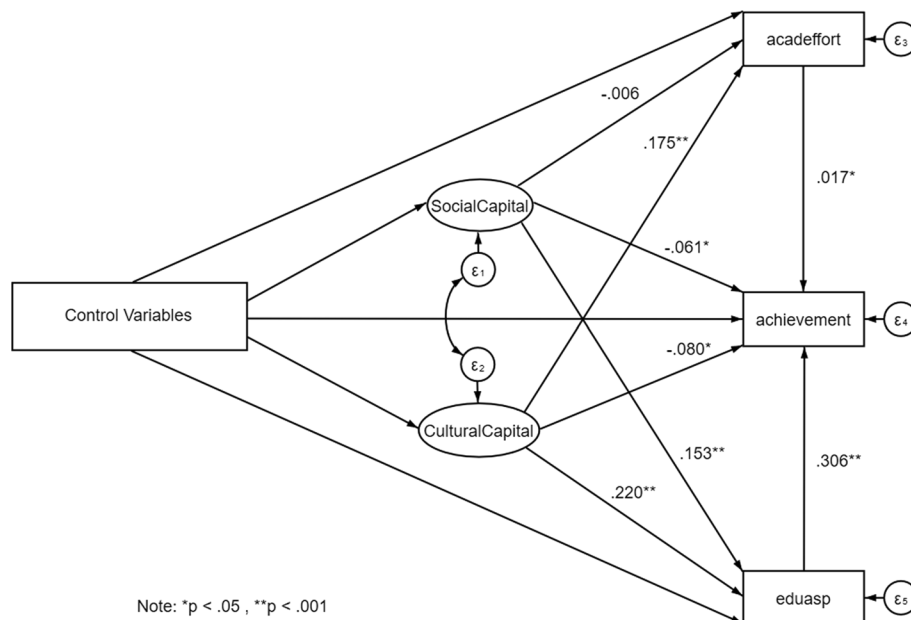


Fig. 4 Standardised solutions for the structural model. SEM results show that family social capital and family cultural capital had significant positive associations with educational aspiration, but significant negative associations with academic achievement. Only family cultural capital had a significant positive association with academic effort, while family social capital showed a non-significant negative association

adolescents was explained by this model, suggesting that the hypothesized structural model was empirically supported by the data.

The standardized factor loadings for the structural model are presented in Fig. 4. The results show that family social capital had a significant positive association with educational aspiration ($\beta = 0.153, p < 0.001$) but a significant negative association with academic achievement ($\beta = -0.061, p < 0.05$) and a nonsignificant negative association with academic effort ($\beta = -0.006, p = 0.810$). In contrast, family cultural capital had a significant positive association with academic effort ($\beta = 0.175, p < 0.001$) and educational aspiration ($\beta = 0.220, p < 0.001$) but a significant negative association with academic achievement ($\beta = -0.080, p < 0.05$). Academic effort ($\beta = 0.017, p < 0.05$) and educational aspiration ($\beta = 0.306, p < 0.001$) had significant positive associations with academic achievement.

The path coefficients (unstandardized and standardized), robust standard errors (clustered by schools), and critical values (z values) for the structural model are presented in Table 5.⁶ Of the sociodemographic characteristics, having better cognitive ability ($\beta = 0.062, p < 0.001$), living with both parents ($\beta = 0.176, p < 0.001$), coming from a family in a better financial condition ($\beta = 0.056, p < 0.001$), and having an urban *hukou* ($\beta = 0.096,$

⁶ Research on child development (e.g., Heckman 2008) suggests that cognitive ability functions as a mechanism of family influence, and other studies (e.g., Peng and Kievit 2020) have found a bi-directional relationship between cognitive ability and academic achievement. In viewing of both lines of research, this study has re-done the analysis by placing cognitive ability in a similar standing as academic effort and educational aspiration in the SEM model, and results showed similar negative coefficients for both family social capital and family cultural capital with academic achievement, albeit the negative associations were not significant this time. As such, we have decided to retain cognitive ability as a control variable for this study. A summary of the test results may be found in Appendix 1, Table 5a. Nonetheless, future research may consider analysing this variable differently, and if doing so, also consider using longitudinal data to tease out the bi-directionality between cognitive ability and academic achievement.

Table 5 Path coefficients and robust standard errors for the structural model

			<i>B</i>	β	<i>S.E.</i> ^a (β)	<i>z</i> (β)
Family social capital	→	Academic effort	-.012	-.006	.023	-0.24
	→	Educational aspirations	.247	.153**	.022	6.80
	→	Academic achievement	-1.226	-.061*	.020	-3.10
Family cultural capital	→	Academic effort	1.052	.175**	.042	4.18
	→	Educational aspirations	1.045	.220**	.040	5.49
	→	Academic achievement	-4.760	-.081*	.035	-2.29
Academic effort	→	Academic achievement	.170	.017*	.008	2.08
Educational aspirations	→		3.789	.306**	.009	35.18
Age	→	Family social capital	-.232	-.236**	.011	-21.29
Gender	→		.052	.021	.011	1.89
Ethnicity	→		.078	.017	.011	1.50
Cognitive ability	→		.092	.062**	.012	5.33
Family structure	→		.524	.176**	.011	15.99
Number of siblings	→		-.245	-.159**	.012	-13.05
Financial condition	→		.050	.056**	.012	4.60
	→					
<i>Hukou</i>			.248	.096**	.013	7.53
Age	→	Family cultural capital	-.037	-.112**	.008	-13.45
Gender	→		.033	.039**	.008	4.77
Ethnicity	→		.072	.046**	.008	5.54
Cognitive ability	→		.084	.168**	.008	19.90
Family structure	→		.127	.125**	.008	15.21
Number of Siblings	→		-.113	-.214**	.009	-24.04
Financial condition	→		.081	.271**	.009	30.71
<i>Hukou</i>	→		.386	.437**	.009	49.41

The path coefficients (unstandardised and standardised), robust standard errors (clustered by schools) and critical values (*z* values) for the structural model are presented

N = 11,313

* $p < .05$, ** $p < .001$

^a Robust standard error (clustered by schools)

$p < 0.001$) were significantly associated with higher levels of family social capital, while being older ($\beta = -0.236, p < 0.001$) and having more siblings ($\beta = -0.159, p < 0.001$) were significantly associated with lower levels of family social capital, although no significant associations were found for being female ($\beta = 0.021, p = 0.059$) or having a Han ethnicity ($\beta = 0.017, p = 0.134$).

Similarly, having better cognitive ability ($\beta = 0.168, p < 0.001$), living with both parents ($\beta = 0.125, p < 0.001$), coming from a family in a better financial condition ($\beta = 0.271, p < 0.001$), and having an urban *hukou* ($\beta = 0.437, p < 0.001$) were significantly associated with higher levels of family cultural capital, and being older ($\beta = -0.112, p < 0.001$) and having more siblings ($\beta = -0.214, p < 0.001$) were significantly associated with lower levels of family cultural capital. However, different from the relationships with family social capital, being female ($\beta = 0.039, p < 0.001$) and having a Han ethnicity ($\beta = 0.046, p < 0.001$) were also found to be significantly associated with higher levels of family cultural capital.

Apart from this, when the effects of both forms of family capital, various sociodemographic characteristics, and the cognitive ability of Chinese adolescents were controlled

for, significant positive associations were found between academic effort and academic achievement ($\beta = 0.017$, $p < 0.05$) and educational aspiration and academic achievement ($\beta = 0.306$, $p < 0.001$).

Discussion

The differences in associations between family social capital and the three educational outcomes evident in the SEM results are interesting. First, the significant positive association between family social capital and educational aspirations supports existing research in both a Western context (Byun et al. 2012a, b; Shahidul et al. 2015) and a Chinese context (An 2005; Ding and Wu 2023). This suggests that net of all other factors, the influence of family social capital on the educational aspirations of adolescents remains beneficial regardless of cultural environment. In the case of China, this finding is not unexpected given that Chinese families have long regarded education as a key to economic success (Wu and Treiman 2007), which thus influences the parent–child relationship in regard to educational expectations and, in turn, children have accordingly adopted high educational goals (Archer and Francis 2006).

Second, the nonsignificant negative association between family social capital and academic effort suggests that parental engagement with and expectations of their children have little bearing on the amount of time spent on homework. This finding contrasts with the results presented in An (2005), as well as the study by Wu and colleagues (2010), which found that family social support had a significant direct effect on migrant children's academic effort, and children who received more social support may be pressured to put more effort into their studies in order to avoid failing to fulfill familial expectations. One viable explanation may be due to the chosen measure of academic effort in this study, which was proxied by the amount of time spent on homework. This measure may not have been truly indicative of children's "true" effort in their studies in the context of China, although it has been utilized in an earlier cross-cultural study of homework time and mathematics achievement across 40 countries that participated in PISA 2003 (Dettmers et al. 2009). As such, this finding requires further research on the unique educational landscape in China.

Third, the significant negative association between family social capital and adolescents' academic achievement runs contrary to some earlier findings in both Western (Dufur et al. 2013; Israel et al. 2001) and Chinese contexts (Liang and Du 2012; Wu et al. 2010) while supporting others in both contexts (Israel et al. 2001; Li and Zheng 2016; Wei 2012). Although this study has, in line with prior research, utilised the frequency of parental involvement as a measure of family social capital, Moroni and colleagues (2015) caution for the need to distinguish quantity and quality when conducting research on parental involvement. Where involvement in homework was concerned, the authors found that such help differs in its effects on children's academic achievement when assessed as a function of quantity or quality—the frequency of parental homework involvement was negatively associated with academic achievement, while parental help that was perceived by children as supportive had positive predictive effects on achievement, whereas help perceived as intrusive had negative effects. This negative association between parental homework involvement (i.e., frequency of parents checking on homework) and achievement was also found by Israel and colleagues (2001). Given that

the current CEPS student survey does not cover areas relating to students' sentiment toward the parental help they receive, future studies may consider finding supplementary data to investigate this aspect when assessing the effects of family social capital on the achievement of Chinese adolescents.

Likewise, the differences in associations between family cultural capital and the three educational outcomes are interesting. First, the significant negative association between family cultural capital and academic achievement does not support earlier findings in Western and Chinese contexts (Byun et al. 2012a, b; Huang and Liang 2016; Wu et al. 2017; Xu and Hampden-Thompson 2011; Yu et al. 2022). However, it must be noted that like earlier research (Huang and Liang 2016), this study utilised only quantity of educational resources as a measure of objectified cultural capital. Given that there were no questions available in the CEPS student survey touching on the type of educational resources in possession, the quality aspect of these resources could not be accounted for (e.g., the quantity of books owned by a family may not translate to having quality educational content that may be beneficial for academic development, such as content from encyclopaedias and literature). This therefore warrants further analyses with supplementary data when assessing the effects of family cultural capital on the academic achievement of Chinese adolescents.

Second, the significant positive associations between family cultural capital and academic effort, as well as educational aspiration, align with the findings reported by An (2005) and Ding and Wu (2023), suggesting that, after taking into account the effects of all other factors, the intergenerational transmission of cultural capital from Chinese parents to their children remains advantageous in facilitating these two educational outcomes. Third, the significant positive associations between academic effort and educational aspiration with academic achievement support the findings by An (2005). Similarly, Chinese adolescents' academic achievement was found to be strongly affected by the amount of effort put into their studies and the level of aspiration in their educational pursuit, which shows that collectively, family social capital and family cultural capital are important factors in one's academic performance, whether through direct impact or indirect impact on adolescents' academic effort and educational aspiration.

Conclusion

This study employed the structural equation modeling approach on a sample of 11,313 students from Grades 7 and 9 at 112 schools in the Chinese mainland to examine how family social capital and family cultural capital affect the academic effort, educational aspiration, and academic achievement of Chinese adolescents. The results showed that both family social capital and family cultural capital were significantly positively associated with the educational aspiration of Chinese adolescents; however, only family cultural capital presented with the same significant positive association with academic effort (family social capital presented with no significant association), and both forms of family capital were significantly negatively associated with academic achievement.

The present study makes three contributions to the literature on family social capital and family cultural capital. First, it has been carefully ensured that only observed indicator variables relevant to Chinese society have been utilized for analyses (which prior studies have tended to be less context-specific) while ensuring that the theoretical concepts of family social capital and family cultural capital are not compromised in their

operationalized measurements (i.e., the exclusion of family structure and number of siblings as a component of family social capital but as a form of a sociodemographic characteristic instead, and the exclusion of highbrow activities as a form of embodied cultural capital). Second, the study provides evidence of the unique contributions of family social capital and family cultural capital on three distinct educational outcomes—academic effort, educational aspiration, and academic achievement, which earlier studies have tended to evaluate separately or not at all. Finally, it has shown 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 due to context dependency.

A few limitations may be noted in the present study. First, it must be noted that the detection of significant associations between latent constructs of family social capital and family cultural capital and the various outcome variables remain correlational at best; therefore, caution must be exercised when interpreting these findings. While considerable effort has been made to ensure that all relative effects are statistically accounted for while evaluating the unique relationships between family social capital, family cultural capital, and the different educational outcomes, this method of assessment, while reasonable, is not without question due to 1) the nonexperimental nature of this study, 2) the availability of only self-report survey data, and 3) the availability of only two years of data at present. Second, although the CEPS is longitudinal in design, the current CEPS dataset utilized in this study remains cross-sectional, given that the survey is ongoing and only two years of data are available to the public. As such, this study used only “between individual” information and was unable to address the problem of omitted variables from “within individual” information.

Given the limitations highlighted, future research may consider employing analyses of longitudinal panel data when new CEPS datasets are made available. In addition, while earlier studies (Israel et al. 2001; Smith et al. 1995), as well as the present study, had only examined the presence or absence of both parents in the home, researchers may also consider the extended family structure, given that child-rearing responsibilities are often tended by the extended family (e.g., grandparents or relatives) while either or both parents are absent. In light of empirical evidence from other studies suggesting the positive effects grandparents have on children’s educational outcomes (Falbo 1991; Møllegaard and Jæger 2015; Zeng and Xie 2014) and the prevalence of grandparents’ roles as educators and caregivers to children while either or both parents are absent due to employment or other reasons, this calls into question how grandparents may also facilitate the positive educational outcomes of Chinese children and adolescents in such circumstances. Apart from this, future research may also consider employing qualitative methodologies to supplement the quantitative analyses to investigate these relationships between family social capital, family cultural capital, and the educational outcomes of academic effort, educational aspirations, and academic achievement in a more in-depth manner.

Appendix

See Table 6.

Table 6 Path coefficients and robust standard errors for the structural model with cognitive ability as a mechanism of family

			<i>B</i>	β	<i>S.E.</i> ^a (β)	<i>z</i> (β)
Family social capital	→	Cognitive ability	-.213	-.314**	.081	-3.87
	→	Academic effort	-.170	-.083*	.040	-2.07
	→	Educational aspiration	-.088	-.054	.065	-0.83
	→	Academic achievement	-1.050	-.053	.032	-1.66
Family cultural capital	→	Cognitive ability	1.907	.931**	.147	6.32
	→	Academic effort	2.034	.331**	.083	3.97
	→	Educational aspiration	3.322	.682**	.120	5.70
	→	Academic achievement	-6.303	-.105	.071	-1.48
Cognitive ability	→	Academic achievement	9.822	.335**	.016	20.83
Academic effort	→		.180	.018	.013	1.44
Educational aspiration	→		3.844	.312**	.015	20.74
Age	→	Family social capital	-.239	-.243**	.015	-15.90
Gender	→		.052	0.21	.014	1.51
Ethnicity	→		.086	.019	.018	1.06
Family structure	→		.534	.179**	.015	12.12
Number of siblings	→		-.258	-.167**	.018	-9.42
Financial condition	→		.055	.062*	.018	3.36
	→					
<i>Hukou</i>			.269	.103**	.026	4.03
Age	→	Family cultural capital	-.043	-.132**	.015	-8.84
Gender	→		.034	.042**	.011	3.80
Ethnicity	→		.079	.051	.028	1.86
Family structure	→		.133	.135**	.017	7.94
Number of siblings	→		-.124	-.241**	.019	-12.83
Financial condition	→		.086	.293**	.018	16.02
<i>Hukou</i>	→		.402	.468**	.023	20.01

We redo the analysis by placing cognitive ability in a similar standing as academic effort and educational aspiration in the SEM model, and results showed similar negative coefficients for both family social capital and family cultural capital with academic achievement, albeit the negative associations were not significant this time

N = 11,313

* $p < .05$, ** $p < .001$

^a Robust standard error (clustered by schools)

Abbreviations

- SEM Structural equation modelling
- CEPS China Education Panel Survey
- PISA Programme for International Student Assessment
- CHCs Confucian heritage cultures
- Non-CHCs Non-Confucian heritage cultures
- GSCF Gansu Survey of Children and Families
- CFA Confirmatory factor analysis
- RMSEA Root mean square error of approximation
- CFI Comparative Fit Index
- SRMR Standardised root mean square residual

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Author contributions

GLCT: Conceptualization, methodology, formal analysis, data curation, writing-original draft; ZF: supervision, writing-review & editing.

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Declarations**Competing interests**

Authors have no conflict of interest to declare.

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