

**Unequal childhoods in China: Parental education and children's time use**

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ABSTRACT

Drawing on Lareau's binary conceptualization of parenting as concerted cultivation and accomplishment of natural growth, we examine how parental background determines the degree to which the two parenting practices are realized in China. To do so, we examine how parental education shapes children's weekly time use patterns on planned activities (academic and non-academic) and unplanned activities. Using multi-level mixed-effects linear models based on the 2014 China Education Panel Survey, we find that parental education is positively associated with concerted cultivation, with children spending more hours on both planned academic and non-academic activities, and negatively associated with accomplishment of natural growth, with children spending more hours on unplanned activities. The link between parental education and children's time use patterns is partly explained by parents' educational expectations for their children, parental supervision, parental support, and economic investments on education.

**Key words:** unequal childhoods, time use, parental education, educational expectations, parental supervision, parental support, educational investments, China

## **Unequal childhoods in China: Parental education and children's time use**

### **1. Introduction**

Research on life course and social stratification has long established the link between family contexts and child development (Astone & McLanahan, 1991; Duncan et al., 1998; Kao & Thompson, 2003; Lucas, 2001; Thornton, 2001; Yeung et al., 2001). Children's cognitive ability, educational and occupational expectations, academic achievement, health, self-esteem, values, and developmental problems are all strongly influenced by the socioeconomic standing of their family (Bengtson, Biblarz & Roberts, 2002; Duncan & Brooks-Gunn, 1997; Entwisle, Alexander & Olson, 2004; Yeung et al., 2002; Mayer, 1997). In this process of translating parental socioeconomic premium into children's developmental advantages, parents' influences on their children's education and development, through aspirational, behavioral, and financial pathways, play a critical role (Conger et al., 1992; Dubow, Boxer, & Huesmann, 2009; Elder et al., 1992; Hu & Mu, 2020; Sampson & Laub, 1994). Parenting behaviors such as spending time with children, supporting their needs, and actively supervising and disciplining them differ across parental socioeconomic backgrounds and lead to various outcomes for children's development (Baumrind, 1971; Lamborn et al., 1991; Maccoby, & Martin, 1983; Parke & Buriel, 1998). Parents' educational expectations for their children and direct investments in their enrichment and development are also important mediating mechanisms between parental socioeconomic backgrounds and children's development (Cheadle and Amato, 2011; Hanson, McLanahan & Thomson, 1997; Liu & Xie, 2015, 2016).

In the existing literature on the social stratification of parenting, children's time use has been widely adopted as the outcome measure (Bianchi & Robinson, 1997; Hofferth, 2009; Hofferth & Curtin, 2005; Hofferth & Sandberg, 2001; Lareau, 2011; Posner & Vandell, 1999). In general, middle- or upper-class children spend more time on organized activities, such as competitive sports, specialized training, and enrichment programs, most of which are arranged by the parents and stick to rigid schedules. Meanwhile, children from working class and poor families spend more time on unorganized activities,

such as watching television and hanging out with other children in the neighborhoods, most of which are initiated by the children themselves. One pioneering research in this area is Lareau's (2011) study on American families, which identified two major styles of parenting—namely, “concerted cultivation” for middle- and upper-class families and “accomplishment of natural growth” for working-class families. While middle- and upper-class parents have their children participate in planned activities such as after-class tutorials and enrichment training programs, working-class parents tend to apply a more relaxed parenting style by allowing their children more unplanned activities such as playing on their own and watching television.

Following this line of work, China constitutes yet another interesting social setting to examine the link between family socioeconomic status and children's time use patterns. In 1988, 2000, and 2010, the Chinese state initiated several waves of “Reducing the Study Load” campaigns (*jian fu*) to relieve young students of heavy schoolwork burdens (Yochim, 2018). As a result, school time was significantly reduced, homework required more parental participation and technological assistance, and school admissions and evaluations increasingly relied on the students' overall “quality” (*su zhi*), including both academic and extracurricular engagements (Yochim, 2018). These educational policy changes may have transferred a great deal of the responsibility for children's development from public schools to individual families and parents. As the state educational system's role in regulating school children's activities became weaker, more socioeconomic differentials likely appeared in Chinese children's daily schedules at the individual level. Not only parents with greater socioeconomic resources are more likely to financially invest in their children's enrichment and development, but they also tend to adopt different parenting behaviors regarding the extents they support and supervise their children (Guo et al., 2018; Han et al., 2019). Meantime, different from most western cultural contexts, Chinese parents hold high expectations for their children regardless of socioeconomic status (Liu and Xie, 2015; Liu et al., 2020). Therefore, it is worth empirically testing whether Chinese children's time use indeed differs across parental socioeconomic statuses and examining the pathways by which these differences occur.

In this paper, we use a national sample of the China Education Panel Survey (CEPS) in 2014 and multi-level mixed-effects linear models to systematically evaluate the impact of parental background on children's time use. Our investigation draws on Lareau's (2011) categorization between concerted cultivation and accomplishment of natural growth and quantifies the degree of realization of the two parenting practices. Specifically, we examine how parental education shapes children's weekly time use patterns on planned activities (academic and non-academic) and unplanned activities. We further unpack the impacts of parental education into three mechanisms, namely, parents' aspirational influences, through parents' educational expectations for their children, parents' behavioral influences, measured by parental supervision and parental support, and parents' financial influences, captured by costs of extracurricular classes and efforts of school selection. By doing so, we get to capture the diverging and increasingly unequal childhoods in China. While Chinese parents hold high expectations for their children regardless of socioeconomic status, the intensified emphasis on children's all-around development and intensive parenting has required rising parental resources and largely transferred the responsibilities for children development from the public educational system to the parents.

## **2. The unequal childhoods framework**

Lareau's (2011) framework on unequal childhoods across social classes is a pioneering study that interprets children's time use arrangements in terms of parenting styles. According to Lareau (2002, 2011), middle- and working-class parents follow different cultural ideologies of childrearing. Middle-class parents embrace the ideology of concerted cultivation whereby they view their children as developmental projects. Thus, they design and craft their children's developmental portfolios through careful time use schedules and various intentionally enrolled activities, both academically and non-academically. Conversely, working-class parents allowed an accomplishment of natural growth, in which there was much less parental involvement in children's daily life, recreation and talk, and they tend to allow their children to arrange their time in a more self-initiated and laissez-faire manner (Lareau, 2002, 2011).

Lareau's seminal ethnographic study on parenting and social reproduction at the stage of elementary education has inspired later studies based on large-scale data in the U.S. (Bodovski and Farkas, 2008; Bodovski, 2010; Carolan, 2016; Cheadle and Amato, 2011; Dumais et al., 2012; Potter and Roksa, 2013) and East Asian countries such as Japan (Matsuoka et al., 2015; Matsuoka, 2019) and Korea (Park et al., 2011). Using data from the Early Childhood Longitudinal Study of Kindergarten Class of 1998-1999 in the U.S., Cheadle and Amato (2011) found that socioeconomic status strongly predicted parents' use of concerted cultivation, largely supporting Lareau's theoretical positions. They found that concerted cultivation is more prevalent among White, English-speaking parents than among Black, Hispanic, and Asian parents. However, they grouped Chinese, Japanese, Vietnamese, and other Asian groups together. Given China's long tradition of cultural emphasis on meritocracy and educational achievement and its standardized and competitive public education system, it is worthwhile to test whether and the extent to which Chinese parents practice concerted cultivation or accomplishment of natural growth.

Another finding from Cheadle and Amato's study (2011) is that the levels of concerted cultivation by parents are higher among daughters than sons. This is because parents tend to perceive daughters to be more receptive to and benefit more from parental directives and influences, including investments in concerted cultivation, than are sons. Parents may also feel that more efforts are required to cultivate daughters to remedy potential disadvantages faced by them in the future due to gender inequality. Therefore, it will be interesting to understand through empirical examinations whether these child gender differences in parental use of concerted cultivation or accomplishment of natural growth would be observed in China where sons have been preferred over daughters for centuries.

Also, while Cheadle and Amato's statistical model captured the construct of concerted cultivation, it left out the other construct—the accomplishment of natural growth. In comparison, our strategy of utilizing children's time use data is able to quantify both constructs.

Lareau's framework of unequal childhoods has also been empirically examined in Asian countries. For example, in Korea, where the education system is highly standardized and parents have

little influence over school schedules or curricula, parents invest a considerable amount of time, efforts, and energy in selecting and using private tutoring for their children's cognitive and non-cognitive development (Park et al., 2011). Similarly, based on four waves (from 1st to 4th graders) of data from the Longitudinal Survey of Babies in the 21st Century, a nationally representative longitudinal study conducted in Japan (Matsuoka et al., 2015) revealed that highly educated parents tend to actively organize, monitor, and supervise their child's time outside the school. As a result, in comparison to their counterparts whose parents have lower levels of education, children with better-educated parents spend longer hours studying outside the school and fewer hours on non-academic activities such as video gaming. Using later waves (from 3rd to 6th graders) of the same dataset in Japan, Matsuoka (2019) further showed that while college-educated parents demonstrated practices of concerted cultivation when their children were in the third grade, they increasingly focused on academic preparation as their children grew older and approached the stage of lower secondary education.

Similar to Korea and Japan, China's education system is also highly standardized and competitive in terms of progression to a higher educational level (i.e., admission to high school or university). Thus, compared to those studies which focused on younger children, by basing our analyses on a sample of Chinese secondary school students, we expect to observe stronger parental emphasis on children's academic preparations for successful educational trajectories, as well as greater influences of parental education on children's time use patterns.

A recent study of primary and secondary school students and their parents in Shanghai (Zhang, 2020) examined middle-class parents' strategies of using private tutoring to prepare their children for critical educational selections. Consistent with Lareau's theorization, Zhang (2020) posited that middle-class parents have higher expectations and strategize deliberately to secure their children's future, and working-class and poor parents have lower expectations and practice more of the accomplishment of natural growth. However, as this study only includes children and parents in Shanghai, it remains to be seen whether its findings apply to China as a whole. Secondly, the working-class and poor parents included in Zhang's study are mostly migrant parents, whose parenting experience may not be

representative of less economically established urban local parents. Furthermore, the categorical distinction between middle-class parents and working-class parents may mask the within-class variations beyond the between-class differences in terms of parenting practices (Chin & Phillips, 2004). In this study, we aim to capture the gradational natures of parenting practices across parents' education.

Overall, our study aims to extend Lareau's framework of unequal childhoods in the following aspects. First, we propose to quantify the constructs of concerted cultivation and accomplishment of natural growth as a continuum by making use of children's time use data. Second, because most of previous studies were restricted to American families (though a few recent studies have begun examining Korean and Japanese families), it remains to be seen whether and to what extent is the practice of concerted cultivation or accomplishment of natural growth shaped by social class in a drastically different socioeconomic and cultural context. To fill this gap, we examine the association between parents' educational level and the degree of concerted cultivation in China. Third, by exploring how parents' education interacts with the gender of the child in affecting the levels of concerted cultivation or accomplishment of natural growth among Chinese families, we reveal the hidden sociocultural assumptions of Lareau's theorization and highlight the role of patriarchal tradition of son preference in shaping parenting practices. Fourth, by investigating aspirational (parents' educational expectations for their children), behavioral (parental supervision of their children's behavior and parental support of their children's needs), and financial (costs of extra-curricular classes and efforts of school selection) mediating channels, we contribute new empirical knowledge about the relative importance of resources versus culture for the continuum of parenting practices between concerted cultivation and accomplishment of natural growth. Finally, in addition to a range of demographic and family characteristics and aggregate-level variations that have been shown to correlate with parenting practices manifested in children's time use patterns, we were also able to control for children's past test scores. This is important to be accounted for as some parents may adjust their parenting practices according to their children's academic performance.



### **3. Linking parental education and children's time use: planned and unplanned activities**

Parental socioeconomic status profoundly influences parenting experiences, and in turn, children's development outcomes. As summarized by Vincent and Maxwell (2016, p. 2), "although parenting is a personal, intensive and intuitive experience, it is also infused with classed behaviors, values, actions and dispositions." Thus, parents' socioeconomic backgrounds may shape parents' subjective and objective influences on their children's education and development (Cheadle and Amato, 2011; Dubow, Boxer, & Huesmann, 2009). Specifically, parents with higher socioeconomic status are more likely to hold higher educational expectations for their children, get more involved in their children's lives through parental supervision and parental support, and also possess richer resources that can effectively translate their aspirations and parenting preferences into children's developmental outcomes (Bae & Wickrama, 2015; Hao & Yeung, 2015; Irwin & Elley, 2011).

Among various measures of parental background, education plays a central role and yields an ideal empirical indicator. With its strong associations with other socioeconomic dimensions, parental education provides an effective and comprehensive summary of family socioeconomic variation. In addition, it does not contain as serious a measurement error as the household financial indicators of parental backgrounds (Becker and Tomes, 1994). Education is also indicative of the parents' lifestyles and cultural preferences, and these "soft" and unobservable characteristics are difficult to capture through other indicators of parental backgrounds (Coleman, 1988; Hao and Yeung, 2015; Lareau, 2011). For example, parents with better socioeconomic backgrounds may have a more democratic relationship with their children (Wang, 2014) and encourage them to participate in extracurricular activities that can transmit qualities such as responsibility, self-discipline, and respect (Dunn, Kinney, & Hofferth, 2003). In contrast, working-class parents sometimes demand obedience and subservience from their children (Lareau, 2011). Therefore, examining the differences in parenting styles across educational levels of the parents is a way to comprehensively understand the link between parental backgrounds and parenting styles. Beyond that, we can further examine how parental education shapes children's time use patterns

through various pathways, both subjectively and objectively, namely, education expectations, behavioral influences through parental supervision and parental support, and financial investments.

Meantime, the links between parental education and children's various time use outcomes can systematically reflect the detailed plans, intentions, and ideologies that have been shaped by the specific parental socioeconomic backgrounds. According to Lareau (2002, 2011), middle-class parents design and craft their children's developmental portfolios through careful time use schedules and various intentionally enrolled activities, including both academic and non-academic ones. Conversely, working-class parents provide less parental involvement in children's daily life, and they tend to allow their children to arrange their time in a more self-initiated and *laissez-faire* manner. Meantime, parents may utilize a mixture of different parenting styles regardless of their socioeconomic backgrounds. That is, rather than falling at one or the other end of the binarization of concerted cultivation and accomplishment of natural growth, parenting style occurs on a continuum. In this paper, taking advantage of data from a nationally representative sample of adolescents, we can quantify the extent to which concerted cultivation and accomplishments of natural growth are realized.

Moreover, most existing studies of children's time use patterns have been conducted in Western societies. For example, Bianchi and Robinson (1997) argued that American children's time use patterns are important because children's human capital and social capital are built through the activities that they partake in. In addition, Hofferth (2010) examined how increased exposure to media at home has changed American children's study habits. Ruiz (2017) asserted that in Spain, adolescents' time allocation between productive and unproductive activities shapes their personality. Findlay, Garner, and Kohen (2010) contended that Canadian children's leisure time or unorganized physical activities contribute to their physical and mental health. Thus, a focus on Asian children's time allocation and its relationship with parental socioeconomic backgrounds is overdue.

Of course, the mechanisms that run from parental education to children's time use can be complex. On the one hand, better-educated parents tend to be assertive to systematically arrange and orchestrate their children's time use schedules. On the other hand, better-educated parents are more often

to facilitate a democratic and equal relationship with their children (Cheadle1 & Amato, 2011; Dubow, Boxer, & Huesmann, 2009). However, the democratic and equal relationships between the better-educated parents and their children are often meant to foster a stimulating environment via frequent parent-child communications and negotiations, and thus to channel and manage their children's difficulties and frustrations in their daily lives, including those associated with the time use arrangements (Lareau, 2011). The democratic and interactive parent-child relationships have made the arrangements of concerted cultivation more likely to be functional and sustainable. Therefore, compared with less-educated parents, better-educated parents are more likely to proactively arrange their children's time, especially given that many planned activities are financially costly.

#### **4. The Chinese context**

China constitutes a unique case for elucidating the link between parental education and children's time use patterns. Due to the meritocratic temperaments in China, individuals are encouraged to proactively pursue upward mobility and success through education and career development. Regardless of social class, Chinese parents hold high expectations for their children's education and enthusiastically invest in it, both financially and through behavioral involvements (Liu & Guo, 2010; Liu & Xie, 2015, 2016).

The rising emphasis on the quality of children in the face of smaller family sizes and the corresponding practice of intensive parenting may have reshaped the respective importance of financial and non-financial investments in children's education (Calarco, 2018; Gu, 2021). Parental attention has increasingly focused on raising children through intensive education and nurturing to make them more capable of securing success in a competitive, high-achieving environment and having a fulfilling life (Calarco, 2018; Lareau, 2011). In this context, parents are expected to closely supervise their children's development outcomes, frequently attend to their needs, and actively participate in their study and extracurricular activities. Such intensive parenting has added to the pressures and responsibilities shouldered by the parents, and thus increasing variations may have emerged across parental

socioeconomic backgrounds through parental arrangements of their children's time use (Calarco, 2018; Collins, 2019; Hays, 1998).

The rise in intensive parenting has been further strengthened in China due to its one-child policy, which started in the late 1970s and lasted for more than three decades until being eased to a universal two-child policy in 2015 and then three-child policy in June 2021 (Zhai et al., 2014). Under the one-child policy, most families were allowed to have only one child, with limited exceptions to have two or three children due to specified ethnicity, health, socioeconomic status, and across regions and the rural/urban divide (Peng, 1997). Having single or only a few children, many Chinese parents were particularly focused on the quality of their children and became intensively involved in caring for and nurturing them and by investing in their education and all-around development (Gu, 2021; Short et al., 2001). The generation of children born under the one-child policy have even been called the “little emperors” in public media and academia because of the excessive amount of attention, care, and investments they received from their families (Want et al., 2009; Zhang et al., 2001).

Changes in China's public education system have also increased pressure on parents and added to their workloads. Compared with Western countries, in China, public education prior to the secondary level is free, and even the secondary and post-secondary levels are generally affordable (Hannum, 1999, 2005). The government frequently evaluates the quality of the public schools and assigns the title “key-point schools” to those with good ratings so as to effectively allocate subsidies (Hannum, 1999; Liu & Xie, 2015; Zhou, Tuma, & Moen, 1996). The public education system in China used to be relatively equal, with nationwide standardized educational curricula designed by the central government and entrance to good schools being largely based on exam scores (Tsang, 1996). Moreover, schools commonly ran full-day, with many schools operating from 7:00 am to 6:00 pm. Consequently, for most students, their time was managed by the public education system in a highly comparable way, regardless of family socioeconomic status (Ye, 2015).

Since the late 1980s, there have been several policy promotions of the “Reducing the Study Load” campaign (*jian fu*) with the aim of producing well-rounded students (Yochim, 2018). Based on this

series of campaigns, reductions in school time have been encouraged. More importantly, with regard to teaching materials, “quality-oriented education” (*su zhi jiao yu*) has been embraced. Study designs have involved more use of modern technologies and required help and monitoring from the parents, in the form of take-home projects and parent-child interactive reading programs. Evaluations and school admissions have also started to incorporate components based on the students’ “quality” and their extracurricular abilities, such as the types of talent training and officially certified specialties (Yochim, 2018). These changes in China’s educational systems have required richer parental resources and transferred more of the children’s time from the previously equitable public education system to the hands of parents, who are greatly differentiated in their preferences, efforts, resources, and ways of arranging their children’s daily time, which are largely shaped by parental socioeconomic backgrounds.

## 5. Hypotheses

Therefore, in this study, we aim to examine how parents across educational backgrounds arrange their children’s time differently, and how the differences can be explained by parents’ aspirational, behavioral, and financial influences on their children’s education and development. Based on the analyses, we want to test the following hypotheses:

*Hypothesis 1 (Unequal childhoods):* Better parental education is associated with more time on planned activities, both academically and non-academically, and less time on unplanned activities.

*Hypothesis 2a (Aspirational influences):* Higher parental education expectation is associated with more time on planned activities, both academically and non-academically, and less time on unplanned activities.

*Hypothesis 2b (Behavioral influences):* Stricter parental supervision and stronger parental support are associated with more time on planned activities, both academically and non-academically, and less time on unplanned activities.

*Hypothesis 2c (Financial influences):* Higher costs of extra-curricular classes and greater efforts on school selection are associated with more time on planned activities, both academically and non-academically, and less time on unplanned activities.

*Hypothesis 3 (Mediating mechanisms):* Parents' aspirational, behavioral, and financial influences on their children's education and development help explain away the associations between parental education and children's time use outcomes.

*Hypothesis 4 (Gender equalization):* Better parental education is associated with more equal gender ideologies and thus smaller gender gaps in children's time use outcomes.

## **6. Methods**

### *6.1. Data*

We use the baseline survey of the China Education Panel Survey (CEPS) for analysis. The survey was conducted by the National Survey Research Center at the Renmin University of China in the 2013-2014 academic year based on a stratified, multi-stage sampling design with the probability of selection proportional to size. The nationally representative sample includes 19,487 seventh and ninth grade students with an average age of 13.7 years; 48.5% of the students are female. The students in the sample were from 438 classrooms at 112 schools in 28 county-level regional units in China.

The CEPS includes various information on demographic and socioeconomic characteristics, as well as a rich battery of questions on time use. To our best knowledge, it is one of three national surveys that collected data on time use and the only survey that focused on middle schoolers with identifiers of classes and schools, so we can account for the aggregate-level variations. Time use information includes doing homework assigned by schoolteachers, doing homework assigned by parents or private tutors, attending tuition programs, participating in after-school sports, doing extracurricular reading, watching television, surfing the internet and playing video games, helping with housework, and sleeping. Except for sleeping, all time use items were reported as the hours spent on each activity on a typical weekday and

a weekend day, respectively, in the last week. In our analysis, we multiply the weekday hours by five and the weekend hours by two and sum the two parts to estimate the weekly hours spent on each activity.

Information on time use was collected using stylized questions. Compared with the time diary approach, stylized questions are more cognitively demanding for the respondent because they require the respondent to frequently recall and calculate (Kan & Pudney, 2008). Moreover, the CEPS did not account for potential multitasking in the questions. Thus, for some observations in the sample, the total daily time does not add up to or exceeds 24 hours a day, which is common among studies using stylized questions for time use (Hu & Mu, 2020; Sayer et al., 2016). However, given that the included activities, such as doing homework and attending tuition programs, happen repeatedly and frequently and the questions were asked in reference to the week right before the survey, measurement errors may be alleviated (Hu & Mu, 2020; Sayer et al., 2016).

Due to misreporting issues, 31.5% of the sample have a total time greater than 24 hours per day or have the time spent sleeping less than 4 hours or more than 12 hours per day. We attributed these observations as missing. With a large number of missing observations, however, listwise deletion may result in biased and inefficient estimates. Thus, we imputed the data using multiple imputation by chained equations with 20 iterations (Van Buuren et al., 1999). Specifically, we used linear regression models for all the continuous variables, and logistic regression model for kindergarten attendance, a set of binary variables regarding ownership of computer and internet, coresidence with grandparents, and whether the parents answered the caregiver questionnaire. All variables and imputation variables are shown in Table A1. Analyses were conducted separately on each imputed sample of size 19,487, and the results were combined as a multiple-imputation estimate using Rubin's rule (Rubin, 1987). We have also conducted sensitivity analyses using samples based on listwise deletions, and the results remain consistent (results of sensitivity analyses are available upon request).

### *6.2. Dependent variables: time use*

To evaluate how children's time allocations differ across parents' education, we group time spent on various activities into three categories: planned academic activities (including doing assignments given by schoolteachers, assignments given by parents or private tutors, and attending tuition programs), planned non-academic activities (including extracurricular reading and after-school sports), and unplanned activities (including watching television, surfing the internet, and playing video games). Attending tuition programs refers to the time on classes taught by private tutors or professional tuition schools to boost the learning of school curriculum. Extracurricular reading is the time spent reading books that are based on extracurricular interests and not related to school curriculum. After-school sports include physical activities out of school. Table 1 shows descriptive statistics of the variables used in the analysis. As shown, on average, adolescents in our sample spend 23.2 hours on planned academic activities per week, 11.5 hours on planned non-academic activities, and 11.2 hours on unplanned activities.

[Table 1 about here]

### *6.3. Independent variables: parental education*

As discussed above, parental education is a predominant determinant of children's time allocation. In our study, we use the highest years of schooling of the father and the mother to measure parental education. As shown in Table 1, the average father of our adolescent sample had 10.2 years of formal education, and the average mother had 9.5 years of formal education.

### *6.4. Mediating variables: aspirational, behavioral, and financial influences*

As aforementioned, we expect parental education to influence their children's time use arrangements through both financial and non-financial ways. Specifically, parental education could have effects through parents' high educational expectations for their children, parents' behavioral involvements with their children's development, and direct financial investments in their children's education. Particularly for parents' behavioral involvements, it has often been divided into two dimensions, namely, the level of



parental control and supervision of their children's behaviors, and the level of parental support and responsiveness toward the children's needs and demands (Baumrind, 1971; Lamborn et al., 1991; Maccoby, & Martin, 1983).

*Aspirational influences:* Specifically, we use parents' expected years of schooling to capture how parents' aspirations, values and plans regarding their children's education influence their children's time use patterns.

*Behavioral influences:* Parents' behavioral influences on their children's education and development are measured by two scales - parental supervision and parental support. Parental supervision reflects the level of parental control over their children's behaviors. It was based on the average value of answers to the set of questions "Do your parents strictly supervise you in the following aspects" regarding school assignments and exams, school performance, school attendance, daily schedule, friends, manner of dressing, time using the internet, and time watching television. The children responded on a scale from 1 "not at all" to 3 "very strict". The Cronbach's alpha for the eight items is 0.77, which shows a decent level of reliability of the scale. Additionally, based on an exploratory factor analysis, the eight items jointly load on one factor heavily with the factor loading ranging from 0.52 to 0.58. Parental support captures the level of attention to and support of the children's needs and demands, which are realized through parent-child interactions and communications. It was based on the average value of answers to the set of questions respectively asked about the father's and the mother's support for the children's daily lives through the question "Does your father/mother often discuss the following issues with you?" regarding things that happened at school, the relationship of the child with his/her friends, the relationship of the child with his/her teachers, the child's emotions and moods, and the child's thoughts and struggles. The children responded on a scale from 1 "never" to 3 "often". The Cronbach's alpha for the ten items is 0.88, which indicates a high level of reliability of the scale. Additionally, based on an exploratory factor analysis, the ten items jointly load on one factor heavily with the factor loading ranging from 0.57 to 0.73.

*Financial influences:* The parents' financial investments in children's education and development capture both extracurricular and school-related costs. Specifically, we use whether the parents spent any

money on extracurricular tuitions and enrichment classes for the current semester to reflect the former. For school-related costs, we draw on the total score across eight binary questions regarding “In order for your child to attend this school, has your family done the following?” These eight items include seeking help from friends, sending gifts to people in charge, paying extra fees, purchasing housing in the school district, changing the place of household registration (*Hukou*), registering the child’s *Hukou* at relatives’ or friends’ households, sending children to obtain various talents and specialty certificates, and other means.

### 6.5. Control variables

We controlled for a range of demographic and family characteristics. Gender has a crucial impact on time allocation, particularly among adolescents (Hu, 2015, 2018; Lloyd et al., 2008). For example, girls tend to be more devoted to academic activities, while boys report spending more time on sports (Hu & Mu, 2020). Gender is a binary variable with male as the reference group. Age is the years of age. Rural *Hukou* is a binary variable, with holding an urban *Hukou* as the reference group. Almost 55% of the sample hold a rural *Hukou*. Parents’ coresidence status may influence the level of care, attention, and supervision that they provide for children’s daily lives and development (Chang et al., 2011). It is a four-category variable, with both parents present as the reference group, and the other three categories include father absent, mother absent, and both parents absent. In our sample, almost 77% of the respondents live with both parents, 9% with fathers absent, 3% with mothers absent, and 11% with both parents absent. Since migration may influence adolescents’ lifestyles and the resources available for more structured activities (Xu & Xie, 2015), we also controlled for the adolescents’ migration status, with being a local as the reference group. Existing studies indicate that both children’s time use and parental investment vary with sibship size, sibship order, and the gendered sibship structure in the family (Chu, Xie, & Yu, 2007; Guo & VanWey, 1999; Hu & Shi, 2020). Thus, we also control for number of siblings and the sibship structure with a set of linear variables, namely, number of older brothers, number of older sisters, number of younger brothers, and number of younger sisters. We also control for the presence of grandparents in

the household as a binary variable. Additionally, self-rated health status is likely to be positively associated with participation in activities such as after-school sports as well as parental education. Thus, we also controlled for self-rated health status, which ranges from 1 “very bad” to 5 “very good.” In addition, we accounted for the adolescents’ grade in school to rule out the potential clustering influences at the grade level. We also controlled for the adolescents’ midterm scores, which is the average of standardized scores for Chinese, mathematics, and English. Specifically, schools disclosed students’ original midterm exam scores to the data collector. Given that the midterm exams vary across schools but are identical within the same grade in the same school, to make the test scores comparable, the data collectors standardized the original test scores toward a mean of 70 and a standard deviation of 10 by school and grade. As time use on the internet might be attributed to differential access to the internet, we control for a three-category variable with “having no computer or internet” as the reference, and “having computer only” and “having both computer and internet” as the other two categories.

### *6.6. Analytical approach*

To account for the nested nature of the data, we used the three-level random-intercept linear regression models. Individual adolescents are the first level, which is nested within classes as the second level and then within schools as the third level. This research design explicitly models the potential interdependence of individual adolescents within the same classes in the same schools.

Because we are mainly interested in the associations between parental education and time use outcomes, and the extent to which parental educational expectations, parental supervision, parental support, and parental investments mediate these associations, we estimated a series of three-level linear models. We first examine how the associations between parental education and the three time use outcomes change by respectively and jointly including parental educational expectations, parental supervision, parental support, and parental investments along with all the control variables. We then further investigate how the associations between parental education and children’s time use differ across gender with all the mediators controlled for.

## 7. Results

### 7.1. Descriptive statistics

[Table 2 about here]

Table 2 describes detailed time use by father's and mother's levels of education. As shown, for both fathers and mothers, the higher the parental education, the more hours spent on planned activities, both academically and non-academically, and the fewer hours on watching television, which is categorized as unplanned activities. However, for time spent on the internet and games, the patterns are less clear. When moving from parents with primary or lower education to fathers with a high school education and mothers with a middle school education, hours spent on the internet and games increase. This result could be due to the internal diversity of time spent on the internet and games, which can be used for both entertainment and educational purposes. This result could also be attributed to the socioeconomic gradient of computer ownership at the lower levels of parental education. That is, owning a computer may be less common for adolescents whose parents have a primary education.

Descriptive statistics generally show that family socioeconomic background indeed has a strong impact on children's time use patterns. Higher parental education leads to stronger concerted cultivation in the form of more planned activities for the children. On the other hand, lower parental education leads children to engage in more unstructured activities, consistent with the expectations of accomplishment of natural growth.

### 7.2. Regression results

Tables 3, 4, and 5 summarize the results examining how parental education, namely, parents' highest years of schooling, is associated with the style of parenting, respectively, in the forms of planned academic activities, planned non-academic activities, and unplanned activities, and how parents' educational expectation, parental supervision, parental support, costs of extracurricular classes, and efforts of school selection mediate the relationship. Table 6 demonstrates how the associations between parents' highest years of schooling and children's time use differ across the child's gender.

[Table 3 about here]

As shown in Table 3, even after controlling for all the socioeconomic and demographic variables, parents' highest years of schooling is positively associated with time on planned academic activities. Specifically, based on Model 1-1, one more year of parental schooling is associated with 26 more minutes (0.435 hours) on planned academic activities per week. But the influences of parents' highest years of schooling may run through aspirational, behavioral, and financial mechanisms. As shown in the table, after introducing parents' educational expectation, parental supervisions, parental support, costs of extracurricular classes, and efforts of school selection, the coefficients on parental education decrease in all the other models.

Regarding the three mechanisms, as shown in Model 1-6 which includes all the relevant variables, with one more year of expected education by the parents, the child spends 17 more minutes (0.290 hours) per week on planned academic activities. In comparison to those adolescents whose parents supervise them less strictly, those with stricter parents spend more hours per week on planned academic activities. It is surprising that the positive coefficient on parental support becomes insignificant, possibly indicating that children of more supportive parents may be able to negotiate for fewer study hours. Regarding financial investments, spending money on extracurricular classes and greater efforts on school selection are both associated with longer hours per week on planned academic activities.

Turning to control variables, the results show that female adolescents spend 2.4 more hours than male adolescents on planned academic activities per week. Adolescents with a rural *Hukou* on average spend 58 minutes (0.965 hours) less on planned academic activities than their urban counterparts, as urban parents may be more invested in practicing intensive parenting. Moreover, better health seems to be associated with less time on planned academic activities. The causality can run in both directions. While healthier adolescents may be less engaged academically and more active in physical activities, those who are intensively focused on studying may be less physically fit than their peers who spend more time being physically active. Ninth-graders spend 5.4 more hours than seventh-graders on planned academic activities, possibly due to ninth-graders being under greater pressure in the face of impending high school

entrance exams. Better educational achievement is also associated with more time on planned academic activities.

[Table 4 about here]

Table 4 focuses on weekly hours on planned non-academic activities. As can be seen in Model 2-1, when controlling for various socioeconomic and demographic variables, parents' highest years of schooling is positively associated with hours on planned non-academic activities; namely, one more year of parental schooling is associated with around 10 more minutes (0.170 hours) on planned non-academic activities per week. After introducing the mediating variables, the coefficients on parental education decrease in all the other models, except the one with financial influences. The increased coefficient on parental education after including the two financial investments variables indicates that arranging non-academic activities are more prevalent among better-educated parents, who are more motivated and culturally predisposed to raise their children to be well-rounded. Then in Model 2-6, when all mediators are included, the coefficient on parental education remains significant with a reduced magnitude. Overall, the comparisons between results in Tables 3 and 4 indicate that to promote non-academic development through planned non-academic activities, such as training for sports specialty and extracurricular reading, require stronger non-instrumental motivations and greater cultural capital from the parents.

Regarding the three mechanisms, as shown in Model 2-6 which includes all the relevant variables, with one more year of expected education by the parents, a child spends around 11 more minutes (0.187 hours) per week on planned non-academic activities. Having stricter parental supervision and stronger parental support are both associated with longer hours of planned non-academic activities. Results of financial investments are different from the hypotheses. While the coefficient on efforts of school selection is insignificant, that on costs of extracurricular classes is significantly negative. Echoing patterns in Table 3, this shows that Chinese parents' financial investments, in extracurricular training or school selection, are more often channeled into their children's academic developments, and non-academic development is still undervalued.

Among control variables, female adolescents spend 58 minutes (0.971 hours) less than male adolescents on planned non-academic activities. Rural adolescents spend almost 23 more minutes (0.378 hours) than their urban counterparts on planned non-academic activities, which could be driven by the varying definition of sports across the urban/rural divide. For example, unstructured play may not be counted toward hours of sports for urban adolescents but may be considered as sports for rural adolescents. Migrants spend almost 36 minutes (0.593 hours) more than their local counterparts. Better health seems to be associated with more time on planned non-academic activities, which may be attributed to more time spent on sports by healthier adolescents. Ninth graders spend almost 44 minutes (0.730 hours) less than seventh graders on planned non-academic activities. Moreover, having both computer and internet is associated with fewer hours on planned non-academic activities.

[Table 5 about here]

As shown in Model 3-1 in Table 5, after controlling for all the socioeconomic and demographic variables, parents' highest years of schooling is negatively associated with time on unplanned activities. Specifically, as shown in Model 3-1, one more year of parental schooling may be associated with almost 16 minutes (0.274 hours) less on unplanned activities. After introducing the mediating variables, the sizes of coefficients on parental education decrease but remain significant.

In the full model, Model 3-6, with one more year of expected education by the parents, the child may spend almost 11 minutes (0.184 hours) less per week on unplanned activities. Having stricter parental supervision and stronger parental support are both associated with less time on unplanned activities. Regarding financial investments, greater costs of extracurricular classes are correlated with less time on unplanned activities. Surprisingly, parental efforts on school selection are positively associated with time on unplanned activities. These patterns possibly echo the earlier patterns that Chinese parents' financial investments, may it be in extracurricular training or school selection, are more often used to improve their children's academic outcomes, while children's non-academic development and free time are not carefully scheduled.

Among control variables, female adolescents spend 1.6 hours less than male adolescents on unplanned activities. Migrant adolescents spend around 35 minutes (0.577 hours) more on unplanned activities than local adolescents. Ninth graders spend over an hour less on unplanned activities than their seventh-grade counterparts. Better educational achievement leads to less time on unplanned activities. Having computer or internet are both associated with more time on unplanned activities.

[Table 6 about here]

Table 6 further shows how the association between parents' highest years of schooling and adolescents' time use patterns differ across gender. As consistently shown across time use outcomes, the interactions between gender and parents' highest years of schooling are insignificant for all the three time use outcomes. Echoing patterns in earlier tables, this is possibly due to better-educated parents tend to schedule their children's time use, regardless of gender.

### 7.3. Revisiting hypotheses

Drawing on the empirical findings, *Hypothesis 1 (Unequal childhoods)* is fully supported that better parental education is associated with more time on planned activities, both academically and non-academically, and less time on unplanned activities.

*Hypothesis 2a (Aspirational influences)* is fully supported that higher parental education expectation is associated with more time on planned academic and non-academic activities and less time on unplanned activities.

*Hypothesis 2b (Behavioral influences)* is fully supported for parental supervision but only partly supported for parental support. In Model 1-6 in Table 3, the coefficient on parental support is insignificant, indicating a more democratic and equal parent-child relationship between more supportive parents and their children who may negotiate away some hours on academic study.

*Hypothesis 2c (Financial influences)* is fully supported for planned academic activities and partly for unplanned activities. For planned non-academic activities, the coefficients on extracurricular costs are negative and on efforts of school selection are insignificant, which suggest that Chinese parents' financial



investments, in extracurricular training or school selection, are more often channeled into their children's academic developments, and non-academic development is still undervalued.

*Hypothesis 3 (Mediating mechanisms)* is partly supported as although after including the mediators, the coefficients on parental education decrease in magnitude, they consistently remain significant. Particularly, in Model 2-5 in Table 4, after including parents' financial influences, the coefficient on parental education even increases. This indicates that parental education, besides the discussed mechanisms, is also indicative of the parents' lifestyles and cultural preferences, and these "soft" and unobservable characteristics may uniquely shape children's non-academic development (Yamamoto & Brinton, 2010).

*Hypothesis 4 (Gender equalization)* is not supported for all the three time use outcomes. This possibly suggest the intensive focus on children's development, regardless of gender.

#### *7.4. Aggregate-level variations*

As one main advantage of the multilevel models is to account for aggregate level variations, next we will look at the intraclass correlation statistics, which indicates the proportion of variance in the outcome variable that is explained by the grouping structure of the multilevel models. By doing so, we expect to fully understand the explanatory power of class- and school-level variations relative to individual and family variations (Hanushek & Rivkin, 2006).

Specifically, for adolescents' time on planned academic activities, variations across schools and classes respectively account for 6.2%-9.3% and 3.3%-3.7% of the unexplained variances according to different model specifications (Table 3). For adolescents' time on planned non-academic activities, variations across schools and classes respectively account for 1.4%-1.8% and 1.5%-1.7% of the unexplained variances (Table 4). For adolescents' time on unplanned activities, variations across schools and classes respectively account for 3.4%-4.3% and 2.0%-2.2% of the unexplained variances (Table 5). These statistics indicate that family characteristics, relative to schools and classes, explain most of the

variations in adolescents' time use arrangements, especially for planned non-academic and unplanned activities.

## **8. Conclusions and discussion**

This study articulated the role of family socioeconomic background in shaping children's time use patterns in China, using a national sample of Chinese middle-school-aged children (CEPS 2014). The estimated links between parental education and children's time use across planned academic activities, planned non-academic activities, and unplanned activities reflect the degree to which two parenting practices are realized, namely, concerted cultivation versus accomplishment of natural growth, according to Lareau's framework of unequal childhoods (2011). We found that family socioeconomic background has a strong impact on the parenting practice. Higher parental education is associated with stronger concerted cultivation, manifested in children spending more hours on planned academic and non-academic activities, and with less practice of accomplishment of natural growth, evident in fewer hours on unplanned activities.

We further found that parents' aspirational, behavioral, and financial influences on children's education and development all mediate the link between parental education and children's time use patterns. However, although the three pathways capture some variations in the link, they cannot explain away the persistently significant impacts of parental education on children's time use patterns. Moreover, the influence of parental education on planned non-academic activities even increases after accounting for parents' financial influences. Also note that, for planned non-academic activities, the coefficients on extracurricular costs are negative and on efforts of school selection are insignificant, which indicate that Chinese parents' financial investments, may it be in extracurricular training or school selection, are more often channeled into their children's academic developments, while children's non-academic development is still undervalued. Additionally, the associations between parental support and planned academic activities are insignificant, suggesting a more democratic and equal parent-child relationship between more supportive parents and their children who may negotiate about fewer hours on academic

studies. These findings combined, indicate that, besides the aspirational, behavioral, and financial mediators, parental education influences children's time use through unique pathways such as preferences and values for an all-around child development beyond academic studies, and these "soft" and unobservable characteristics may uniquely shape children's time use patterns.

The intraclass statistics indicate that family characteristics, relative to variations across schools and classes, explain most variations in adolescents' time use arrangements, especially for planned non-academic activities and unplanned activities.

We are aware of the limitations of our study. First, although parental education is likely to be exogenous to their children's time use outcomes, the proposed mechanisms regarding parents' aspirational, behavioral, and financial influences on their children's education and development may be shaped by and adapted to the children's behaviors and time use schedules. Using panel studies when more waves of the survey data become available would be ideal. Second, CEPS is a school-based survey. Therefore, it excludes the drop-out adolescents, who are more likely to be engaged in work or housework (Hsin, 2007; Larson & Verma, 1999; Lloyd et al., 2008). This exclusion may lead to an overestimation of time spent on activities discussed in this study. However, considering that China's compulsory education includes six years of primary school and three years of middle school, most adolescents at middle school ages are likely to stay in school at least until the ninth grade. In fact, our results (available upon request) using the China Family Panel Studies, a household-based survey, are largely consistent with patterns shown in this paper regarding the link between parental education and adolescents' time use. These results corroborate our speculation that the selection issue is not severe for the current study. Third, as aforementioned, information on time use was collected using stylized questions, rather than time diaries. Aside from reporting errors, adolescents may also report more time on more socially desirable activities such as doing homework and less time on activities such as surfing the internet and gaming. However, the CEPS is one of the only three surveys that include a full battery of questions on time use in China, and all three surveys use stylized questions. In addition, the CEPS is the only national survey with a sizable

sample of middle schoolers. Moreover, our estimates of time use items are consistent with previous studies based on different datasets.

Despite the limitations, this study makes several contributions to the literature. First, among the multiple indicators of parental backgrounds, such as income, wealth, and race, education is a comprehensive measure. It is indicative of both socioeconomic status, and lifestyles and preferences that education has imparted to the parents, which cannot be fully captured by other indicators of parental backgrounds. Therefore, to examine the differences in children's time use across educational levels of the parents is a way to comprehensively understand the relationship and mechanisms between parental backgrounds and children's time use patterns.

Second, although much empirical work has been done to assess how socioeconomic characteristics shape various aspects of parenting, there has been limited empirical effort examining the channeling of parenting experiences into children's time use outcomes. This study, drawing on Lareau's (2011) conceptualization of children's time use into two parenting styles—concerted cultivation and accomplishment of natural growth—examines the link between parental education and children's time allocation in planned academic and non-academic activities and in unplanned activities. By doing so, we quantify the degree of realization of the two parenting styles and project it on a continuum between concerned cultivation and accomplishment of natural growth.

Third, studies on children's time use patterns have focused on Western societies. China constitutes an interesting case for examining the link between parental socioeconomic status and children's time use patterns. Although Chinese parents emphasize the importance of education and hold high expectations for their children regardless of socioeconomic status, the “Reducing the Study Load” campaigns (*jian fu*) enacted since the late 1980s have largely transferred the responsibilities and opportunities for children development from the public education system to the parents. Despite Chinese parents' universally high educational expectations, parents with richer resources are better equipped to invest more, in terms of financial resources, attention, time, and regarding school selection, in their children's education and overall development. Thus, Chinese children's childhoods may start to diverge

and become increasingly unequal. It is high time to examine how children's time use patterns differ across parental socioeconomic statuses and by what pathways in contemporary China.

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## TABLES

Table 1. Sample Descriptive Statistics  
(estimated across 20 imputed datasets,  $N=19,487$ )

	Mean/Percentage	S.D.
<i>Weekly time use (in hours)</i>		
Planned activities: academic	23.19	15.46
Planned activities: non-academic	11.47	8.71
Unplanned activities	11.17	10.99
<i>Parental education</i>		
Father's years of schooling	10.24	3.03
Mother's years of schooling	9.48	3.45
Parents' highest years of schooling	10.73	2.94
<i>Other parental information</i>		
Parents' educational expectation (years of schooling)	15.56	2.83
Parental supervision (1-3)	2.34	0.40
Parental support (1-3)	2.01	0.52
Whether spend on extracurricular classes this semester (ref.=not)	33.34	
Efforts of school selection (0-8)	0.35	0.71
<i>Control variables</i>		
Female (ref.=male)	48.47	
Age	13.71	1.21
Rural hukou (ref.=urban hukou)	54.84	
Parental coresidence status		
Both present (reference)	76.73	
Father absent	9.28	
Mother absent	3.46	
Both parents absent	10.52	
Migrant (ref.=not)	17.80	
Sibship status		
Number of older brothers	0.14	0.39
Number of older sisters	0.27	0.55
Number of younger brothers	0.25	0.46
Number of younger sisters	0.18	0.42
Coresiding with grandparents (ref.=not)	30.54	
Subjective health status (1-5)	4.05	0.90
Grade 9 (ref.=Grade 7)	47.25	
Average of standardized scores in Chinese, English and Math	69.94	8.71
Computer and internet		
Having no computer nor internet (reference)	31.04	
Having computer only	8.45	
Having both computer and internet	60.51	

Source : 2013-2014 China Education Panel Survey.

Note: Scores in Chinese, English and Math have been standardized with a mean of 70 and a standard deviation of 10.

Table 2. Itemized Weekly Time Use by Parents' Level of Education  
(estimated across 20 imputed datasets,  $N=19,487$ )

	Planned activities					Unplanned activities	
	Academic			Non-Academic		TV	Internet & Game
	School Study	Homework	Afterschool Tuition	Sports	Reading		
<u>Overall</u>	15.8	4.5	2.9	5.2	6.3	6.5	4.7
<i>Father</i>							
Primary or below	14.8	3.4	1.3	4.8	5.7	7.6	4.7
Middle school	15.2	3.8	2.0	5.2	6.2	7.0	4.8
High school	16.2	5.1	3.6	5.2	6.5	5.9	4.9
Associate college or above	18.2	6.4	5.8	5.5	6.9	4.6	4.1
<i>Mother</i>							
Primary or below	15.2	3.6	1.4	4.8	5.7	7.6	4.4
Middle school	15.3	3.9	2.2	5.2	6.4	6.7	5.0
High school	16.4	5.3	4.0	5.3	6.6	5.7	4.9
Associate college or above	18.1	6.5	6.0	5.5	6.7	4.5	4.2

Note: Parental education is used as a categorical variable in this table for descriptive purposes. For the multilevel analyses, we use the highest years of parental schooling to measure parental education.

Source : 2013-2014 China Education Panel Survey.

Table 3. Multi-level mixed-effects linear models on children's weekly hours on planned academic activities (N=19,487)

	Model 1-1	Model 1-2	Model 1-3	Model 1-4	Model 1-5	Model 1-6
Parents' highest years of schooling	0.435*** (0.051)	0.383*** (0.052)	0.416*** (0.051)	0.417*** (0.051)	0.374*** (0.050)	0.323*** (0.051)
Parents' educational expectation (years of schooling)		0.397*** (0.048)				0.290*** (0.047)
Parental supervision (1-3)			4.198*** (0.299)			3.719*** (0.321)
Parental support (1-3)				1.091*** (0.257)		-0.089 (0.272)
Whether spend on extracurricular classes this semester (ref.=not)					5.441*** (0.318)	5.196*** (0.317)
Effort of school selection (0-8)					0.831*** (0.193)	0.827*** (0.192)
Female (ref.=male)	2.560*** (0.262)	2.602*** (0.263)	2.405*** (0.262)	2.498*** (0.261)	2.482*** (0.259)	2.385*** (0.258)
Age	0.122 (0.208)	0.200 (0.207)	0.179 (0.207)	0.128 (0.208)	0.084 (0.206)	0.193 (0.204)
Rural hukou (ref.=urban hukou)	-1.101*** (0.296)	-1.104*** (0.295)	-1.130*** (0.294)	-1.106*** (0.295)	-0.926** (0.296)	-0.965*** (0.295)
Parental coresidence (ref.=both parents present)						
<i>father absent</i>	0.130 (0.408)	0.110 (0.408)	0.248 (0.407)	0.209 (0.408)	0.155 (0.406)	0.236 (0.405)
<i>mother absent</i>	-0.175 (0.632)	-0.114 (0.632)	0.293 (0.629)	-0.066 (0.632)	-0.020 (0.628)	0.421 (0.626)
<i>both parents absent</i>	-0.115 (0.437)	-0.060 (0.437)	0.143 (0.435)	-0.037 (0.439)	-0.040 (0.434)	0.217 (0.434)
Migrant (ref.=not a migrant)	0.240 (0.392)	0.200 (0.391)	0.148 (0.391)	0.240 (0.392)	0.326 (0.386)	0.212 (0.385)
Sibship status						
<i>Number of older brothers</i>	-0.577 (0.396)	-0.588 (0.395)	-0.527 (0.394)	-0.566 (0.396)	-0.569 (0.395)	-0.533 (0.393)
<i>Number of older sisters</i>	-0.315 (0.236)	-0.337 (0.235)	-0.297 (0.235)	-0.301 (0.236)	-0.287 (0.234)	-0.288 (0.233)
<i>Number of younger brothers</i>	-0.092 (0.338)	-0.066 (0.336)	-0.081 (0.335)	-0.061 (0.338)	-0.077 (0.331)	-0.051 (0.326)
<i>Number of younger sisters</i>	-0.613 (0.334)	-0.597 (0.334)	-0.647 (0.335)	-0.592 (0.334)	-0.562 (0.328)	-0.585 (0.329)
Coresiding with grandparents (ref.= not)	-0.053 (0.274)	-0.074 (0.275)	-0.075 (0.273)	-0.069 (0.275)	-0.044 (0.269)	-0.079 (0.269)
Subjective health status (1-5)	-0.438** (0.139)	-0.489*** (0.139)	-0.573*** (0.138)	-0.507*** (0.141)	-0.387** (0.137)	-0.541*** (0.138)
Grade 9 (ref.=Grade 7)	5.514*** (0.551)	5.608*** (0.548)	5.668*** (0.546)	5.560*** (0.549)	5.196*** (0.540)	5.412*** (0.534)
Average of standardized scores in Chinese, English and Math	0.091*** (0.017)	0.047* (0.018)	0.087*** (0.016)	0.086*** (0.017)	0.088*** (0.016)	0.052** (0.018)
Computer and internet (ref.= none)						
<i>Having computer only</i>	0.519 (0.495)	0.513 (0.494)	0.448 (0.493)	0.529 (0.494)	0.538 (0.489)	0.470 (0.486)
<i>Having both computer and internet</i>	0.128 (0.358)	0.116 (0.358)	0.176 (0.358)	0.101 (0.359)	-0.092 (0.351)	-0.043 (0.351)
Intercept	9.188** (3.094)	5.813 (3.066)	-0.343 (3.195)	7.755* (3.121)	8.373** (3.042)	-2.390 (3.119)
Between-school variance	19.711*** (3.190)	18.547*** (3.022)	19.716*** (3.178)	19.614*** (3.170)	12.830*** (2.240)	12.361*** (2.161)
Between-class variance	7.896*** (1.069)	7.617*** (1.043)	7.646*** (1.038)	7.810*** (1.061)	6.772*** (0.965)	6.447*** (0.930)
Between-individual variance	186.383*** (2.297)	185.596*** (2.298)	183.850*** (2.283)	186.126*** (2.296)	181.941*** (2.255)	179.321*** (2.245)

Notes: The results shown here are based on 20 imputed complete datasets. Standard errors are reported in parentheses. \*p<.05, \*\*p<.01, \*\*\*p<.001. Scores in Chinese, English and Math have been standardized with a mean of 70 and a standard deviation of 10.

Source: 2013-2014 China Educational Panel Survey.

Table 4. Multi-level mixed-effects linear models on children's weekly hours on planned non-academic activities (N=19,487)

	Model 2-1	Model 2-2	Model 2-3	Model 2-4	Model 2-5	Model 2-6
Parents' highest years of schooling	0.170*** (0.034)	0.134*** (0.035)	0.163*** (0.034)	0.127*** (0.034)	0.182*** (0.034)	0.116** (0.035)
Parents' educational expectation (years of schooling)		0.240*** (0.032)				0.187*** (0.032)
Parental supervision (1-3)			1.641*** (0.194)			0.696*** (0.199)
Parental support (1-3)				2.353*** (0.145)		2.088*** (0.149)
Whether spend on extracurricular classes this semester (ref.=not)					-0.746*** (0.188)	-0.887*** (0.186)
Effort of school selection (0-8)					0.180 (0.111)	0.169 (0.110)
Female (ref.=male)	-0.868*** (0.154)	-0.846*** (0.154)	-0.929*** (0.154)	-1.006*** (0.153)	-0.842*** (0.154)	-0.971*** (0.152)
Age	-0.046 (0.128)	0.001 (0.128)	-0.026 (0.128)	-0.033 (0.127)	-0.053 (0.128)	0.004 (0.128)
Rural hukou (ref.=urban hukou)	0.454* (0.185)	0.466* (0.185)	0.435* (0.185)	0.438* (0.184)	0.405* (0.187)	0.378* (0.185)
Parental coresidence (ref.=both parents present)						
<i>father absent</i>	-0.219 (0.271)	-0.231 (0.271)	-0.176 (0.272)	-0.051 (0.271)	-0.231 (0.271)	-0.077 (0.271)
<i>mother absent</i>	-0.971* (0.420)	-0.929* (0.419)	-0.789 (0.419)	-0.730 (0.415)	-1.018* (0.421)	-0.700 (0.416)
<i>both parents absent</i>	-0.032 (0.249)	-0.001 (0.249)	0.062 (0.249)	0.143 (0.248)	-0.061 (0.249)	0.155 (0.248)
Migrant (ref.=not a migrant)	0.641** (0.229)	0.619** (0.228)	0.616** (0.228)	0.655** (0.227)	0.601** (0.230)	0.593** (0.227)
Sibship status						
<i>Number of older brothers</i>	-0.115 (0.201)	-0.120 (0.201)	-0.098 (0.201)	-0.087 (0.201)	-0.121 (0.201)	-0.093 (0.200)
<i>Number of older sisters</i>	-0.130 (0.148)	-0.143 (0.148)	-0.125 (0.148)	-0.099 (0.146)	-0.137 (0.148)	-0.118 (0.145)
<i>Number of younger brothers</i>	0.259 (0.208)	0.279 (0.207)	0.264 (0.207)	0.336 (0.207)	0.237 (0.208)	0.321 (0.206)
<i>Number of younger sisters</i>	-0.085 (0.197)	-0.073 (0.197)	-0.099 (0.197)	-0.034 (0.197)	-0.103 (0.197)	-0.055 (0.197)
Coresiding with grandparents (ref.= not)	0.207 (0.167)	0.193 (0.166)	0.198 (0.166)	0.169 (0.165)	0.210 (0.166)	0.159 (0.164)
Subjective health status (1-5)	0.587*** (0.081)	0.555*** (0.082)	0.534*** (0.081)	0.438*** (0.081)	0.585*** (0.081)	0.405*** (0.081)
Grade 9 (ref.=Grade 7)	-0.966** (0.318)	-0.910** (0.316)	-0.898** (0.316)	-0.863** (0.315)	-0.903** (0.319)	-0.730* (0.313)
Average of standardized scores in Chinese, English and Math	0.020* (0.009)	-0.007 (0.010)	0.018 (0.009)	0.009 (0.010)	0.021* (0.009)	-0.011 (0.010)
Computer and internet (ref.= none)						
<i>Having computer only</i>	-0.409 (0.309)	-0.419 (0.308)	-0.435 (0.309)	-0.397 (0.308)	-0.389 (0.310)	-0.392 (0.307)
<i>Having both computer and internet</i>	-0.384* (0.187)	-0.404* (0.186)	-0.357 (0.186)	-0.452* (0.185)	-0.324 (0.187)	-0.375* (0.185)
Intercept	7.251*** (2.027)	5.248* (2.035)	3.556 (2.125)	4.187* (2.029)	7.326*** (2.030)	1.494 (2.116)
Between-school variance	1.338 (0.306)	1.215 (0.284)	1.193 (0.282)	1.122 (0.269)	1.359 (0.310)	1.047 (0.255)
Between-class variance	1.246 (0.248)	1.176 (0.240)	1.187 (0.242)	1.156 (0.237)	1.241 (0.247)	1.090 (0.229)
Between-individual variance	71.943*** (0.980)	71.658*** (0.962)	71.599*** (0.981)	70.714*** (0.955)	71.832*** (0.985)	70.346*** (0.950)

Notes: The results shown here are based on 20 imputed complete datasets. Standard errors are reported in parentheses. \*p<.05, \*\*p<.01, \*\*\*p<.001. Scores in Chinese, English and Math have been standardized with a mean of 70 and a standard deviation of 10.

Source: 2013-2014 China Educational Panel Survey.



Table 5. Multi-level mixed-effects linear models on children's weekly hours on unplanned activities (N=19,487)

	Model 3-1	Model 3-2	Model 3-3	Model 3-4	Model 3-5	Model 3-6
Parents' highest years of schooling	-0.274*** (0.042)	-0.236*** (0.042)	-0.259*** (0.041)	-0.239*** (0.042)	-0.260*** (0.041)	-0.206*** (0.042)
Parents' educational expectation (years of schooling)		-0.286*** (0.041)				-0.184*** (0.042)
Parental supervision (1-3)			-3.993*** (0.241)			-3.320*** (0.248)
Parental support (1-3)				-2.169*** (0.204)		-1.233*** (0.211)
Whether spend on extracurricular classes this semester (ref.=not)					-1.055*** (0.222)	-0.824*** (0.221)
Effort of school selection (0-8)					0.267* (0.124)	0.280* (0.123)
Female (ref.=male)	-1.779*** (0.204)	-1.807*** (0.204)	-1.630*** (0.201)	-1.655*** (0.204)	-1.744*** (0.206)	-1.572*** (0.203)
Age	0.095 (0.151)	0.039 (0.152)	0.041 (0.151)	0.084 (0.151)	0.086 (0.151)	-0.000 (0.151)
Rural hukou (ref.=urban hukou)	-0.007 (0.227)	-0.013 (0.228)	0.032 (0.225)	0.007 (0.226)	-0.061 (0.230)	-0.014 (0.228)
Parental coresidence (ref.=both parents present)						
<i>father absent</i>	0.181 (0.296)	0.194 (0.295)	0.072 (0.294)	0.025 (0.294)	0.168 (0.296)	-0.002 (0.292)
<i>mother absent</i>	1.338* (0.523)	1.293* (0.521)	0.895 (0.520)	1.122* (0.524)	1.275* (0.525)	0.763 (0.522)
<i>both parents absent</i>	0.566 (0.348)	0.524 (0.348)	0.324 (0.346)	0.406 (0.346)	0.532 (0.347)	0.216 (0.344)
Migrant (ref.=not a migrant)	0.550* (0.264)	0.588* (0.263)	0.630* (0.261)	0.555* (0.262)	0.479 (0.263)	0.577* (0.259)
Sibship status						
<i>Number of older brothers</i>	0.397 (0.243)	0.406 (0.243)	0.351 (0.242)	0.377 (0.242)	0.392 (0.243)	0.348 (0.241)
<i>Number of older sisters</i>	0.320 (0.193)	0.336 (0.193)	0.304 (0.192)	0.295 (0.193)	0.314 (0.193)	0.297 (0.192)
<i>Number of younger brothers</i>	0.039 (0.275)	0.020 (0.274)	0.028 (0.274)	-0.023 (0.274)	0.013 (0.275)	-0.042 (0.274)
<i>Number of younger sisters</i>	0.206 (0.271)	0.194 (0.271)	0.239 (0.271)	0.165 (0.271)	0.184 (0.270)	0.182 (0.269)
Coresiding with grandparents (ref.= not)	0.058 (0.212)	0.072 (0.212)	0.079 (0.210)	0.088 (0.211)	0.062 (0.211)	0.106 (0.210)
Subjective health status (1-5)	-0.092 (0.107)	-0.054 (0.107)	0.038 (0.107)	0.046 (0.108)	-0.095 (0.107)	0.118 (0.108)
Grade 9 (ref.=Grade 7)	-0.895* (0.400)	-0.961* (0.398)	-1.046** (0.397)	-0.989* (0.398)	-0.807* (0.399)	-1.044** (0.393)
Average of standardized scores in Chinese, English and Math	-0.188*** (0.011)	-0.156*** (0.013)	-0.184*** (0.011)	-0.178*** (0.011)	-0.187*** (0.011)	-0.157*** (0.013)
Computer and internet (ref.= none)						
<i>Having computer only</i>	1.457*** (0.360)	1.464*** (0.359)	1.521*** (0.358)	1.438*** (0.358)	1.478*** (0.360)	1.524*** (0.357)
<i>Having both computer and internet</i>	2.891*** (0.246)	2.901*** (0.246)	2.829*** (0.244)	2.937*** (0.245)	2.958*** (0.246)	2.927*** (0.243)
Intercept	25.395*** (2.242)	27.810*** (2.269)	34.458*** (2.329)	28.237*** (2.261)	25.508*** (2.245)	36.186*** (2.347)
Between-school variance	4.862*** (0.905)	4.375*** (0.831)	4.378*** (0.829)	4.231*** (0.805)	4.715*** (0.880)	3.743*** (0.728)
Between-class variance	2.502*** (0.461)	2.399*** (0.448)	2.343*** (0.436)	2.362*** (0.442)	2.469*** (0.457)	2.221*** (0.420)
Between-individual variance	106.585*** (1.393)	106.195*** (1.371)	104.334*** (1.380)	105.594*** (1.398)	106.399*** (1.389)	103.732*** (1.369)

Notes: The results shown here are based on 20 imputed complete datasets. Standard errors are reported in parentheses. \*p<.05, \*\*p<.01, \*\*\*p<.001. Scores in Chinese, English and Math have been standardized with a mean of 70 and a standard deviation of 10.

Source: 2013-2014 China Educational Panel Survey.

Table 6. Multi-level mixed-effects linear models on children's weekly hours on various activities with interactions between parental education and gender (N=19,487)

	planned academic activities	planned non-academic activities	unplanned activities
Parents' highest years of schooling	0.394*** (0.066)	0.153*** (0.042)	-0.220*** (0.052)
Female (ref.=male)	4.022*** (1.015)	-0.119 (0.567)	-1.896** (0.672)
Parents' highest years of schooling *	-0.151 (0.088)	-0.079 (0.049)	0.030 (0.060)
Female (ref.=male)	0.288*** (0.047)	0.186*** (0.032)	-0.184*** (0.042)
Parents' educational expectation (years of schooling)	3.704*** (0.320)	0.688*** (0.199)	-3.317*** (0.248)
Parental supervision (1-3)	-0.075 (0.271)	2.095*** (0.149)	-1.236*** (0.211)
Parental support (1-3)	5.206*** (0.317)	-0.882*** (0.187)	-0.826*** (0.221)
Whether spend on extracurricular classes this semester (ref.=not)	0.824*** (0.192)	0.168 (0.110)	0.281* (0.123)
Effort of school selection (0-8)	0.191 (0.204)	0.004 (0.128)	-0.000 (0.151)
Age	-0.974** (0.294)	0.374* (0.185)	-0.012 (0.227)
Rural hukou (ref.=urban hukou)			
Parental coresidence (ref.=both parents present)			
<i>father absent</i>	0.249 (0.405)	-0.070 (0.271)	-0.005 (0.291)
<i>mother absent</i>	0.424 (0.626)	-0.698 (0.416)	0.762 (0.522)
<i>both parents absent</i>	0.220 (0.433)	0.157 (0.248)	0.215 (0.344)
Migrant (ref.=not a migrant)	0.226 (0.384)	0.600** (0.227)	0.574* (0.259)
Sibship status (ref.=only child)			
<i>Number of older brothers</i>	-0.555 (0.395)	-0.104 (0.201)	0.353 (0.241)
<i>Number of older sisters</i>	-0.277 (0.234)	-0.112 (0.145)	0.295 (0.192)
<i>Number of younger brothers</i>	-0.102 (0.330)	0.295 (0.206)	-0.032 (0.273)
<i>Number of younger sisters</i>	-0.594 (0.329)	-0.060 (0.197)	0.184 (0.270)
Coresiding with grandparents (ref.=not)	-0.083 (0.269)	0.157 (0.164)	0.107 (0.210)
Subjective health status (1-5)	-0.542*** (0.138)	0.404*** (0.081)	0.118 (0.108)
Grade 9 (ref.=Grade 7)	5.409*** (0.534)	-0.732* (0.313)	-1.044** (0.393)
Average of standardized scores in Chinese, English and Math	0.052** (0.018)	-0.011 (0.010)	-0.157*** (0.012)
Computer and internet (ref.= none)			
<i>Having computer only</i>	0.467 (0.485)	-0.394 (0.307)	1.524*** (0.357)
<i>Having both computer and internet</i>	-0.051 (0.350)	-0.379* (0.185)	2.929*** (0.243)
Intercept	-3.042 (3.110)	1.152 (2.148)	36.316*** (2.360)
Between-school variance	12.359*** (2.160)	1.046 (0.255)	3.746*** (0.728)
Between-class variance	6.453*** (0.930)	1.086 (0.229)	2.222*** (0.420)
Between-individual variance	179.264*** (2.241)	70.334*** (0.951)	103.727*** (1.370)

Notes: The results shown here are based on 20 imputed complete datasets. Standard errors are reported in parentheses. \*p < .05, \*\*p < .01, \*\*\*p < .001. Scores in Chinese, English and Math have been standardized with a mean of 70 and a standard deviation of 10.

Source: 2013-2014 China Educational Panel Survey.

## APPENDIX

**Table A1.** Percent of missing values in variables included in the multiple imputation process

	Number of cases with missing values	Percent Missing
<b>Imputation variables</b>		
Time spent studying at school	6,147	31.54
Time spent doing homework	6,147	31.54
Time spent studying at tuition programs	6,147	31.54
Time spent reading	6,147	31.54
Time spend on sports	6,147	31.54
Time spent watching TV	6,147	31.54
Time spent surfing the Internet and playing games	6,147	31.54
Time spent doing housework	6,147	31.54
Time spent sleeping	6,147	31.54
Mother's years of schooling	46	0.24
Father's years of schooling	46	0.24
Parents' highest years of schooling	46	0.24
Parental educational expectation (years of schooling)	842	4.32
Parental supervision	53	0.27
Parental support	70	0.36
Costs of extracurricular classes this semester	1,647	8.45
Age	462	2.37
Migration status	121	0.62
Number of older brothers	2,355	12.08
Number of older sisters	1,956	10.04
Number of younger brothers	1,872	9.61
Number of younger sisters	2,255	11.57
Subjective health status	162	0.83
Depression	396	2.03
Self educational expectation (years of schooling)	851	4.37
Social competence	136	0.70
Attitudinal openness	683	3.50
Openness toward social relations	1,421	7.29
Conscientiousness	600	3.08
Standardized score in Chinese	486	2.49
Standardized score in Math	497	2.55
Standardized score in English	491	2.52
Ever attended kindergarten	152	0.78
Computer only	235	1.21
Both computer and internet	235	1.21
Coresiding with grandparents	291	1.49
Parents responded the caregiver questionnaire	686	3.52
<b>Complete variables</b>		
Efforts of school selection	0	0.00
Female	0	0.00
Rural hukou	0	0.00
Parents' coresidence status	0	0.00
Scores on cognitive test	0	0.00
Grade 9	0	0.00
Parents' highest job status	0	0.00

Note: Full sample size is 19,487.