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### Abstract

In recent decades, China has transformed from a relatively egalitarian society to a highly unequal one. What are the implications of high levels of inequality for the lives of children? Drawing on two newly available, nationally representative datasets, the China Family Panel Studies and the China Education Panel Survey, we develop a comprehensive portrait of childhood inequality in post-reform China. Analyses reveal stark disparities between children from different socioeconomic backgrounds in family environments and in welfare outcomes, including physical health, psychosocial health, and educational performance. We argue that childhood inequality in China is driven not only by the deprivations of poverty, but also by the advantages of affluence, as high socioeconomic status children diverge from their middle and low socioeconomic status counterparts on various family environment and child welfare measures.

### Keywords

child welfare, socioeconomic inequality, family inequality, educational inequality, family investments, family stress

### Disciplines

Demography, Population, and Ecology | Early Childhood Education | Education | Family, Life Course, and Society | Inequality and Stratification | Sociology

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## Childhood inequality in China

Natalie A.E. Young<sup>a</sup> (corresponding author)

Emily C. Hannum<sup>b</sup>

### Abstract

In recent decades, China has transformed from a relatively egalitarian society to a highly unequal one. What are the implications of high levels of inequality for the lives of children? Drawing on two newly available, nationally representative datasets, the China Family Panel Studies and the China Education Panel Survey, we develop a comprehensive portrait of childhood inequality in post-reform China. Analyses reveal stark disparities between children from different socioeconomic backgrounds in family environments and in welfare outcomes, including physical health, psychosocial health, and educational performance. We argue that childhood inequality in China is driven not only by the deprivations of poverty, but also by the advantages of affluence, as high socioeconomic status children diverge from their middle and low socioeconomic status counterparts on various family environment and child welfare measures.

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## Introduction

The People's Republic of China has witnessed rapid growth in income inequality over the past three decades, following the introduction of market reforms in 1978. According to World Bank estimates, the share of income held by the bottom 20 percent of income earners fell from nine to five percent between 1981 and 2010, while the share of income held by the top 20 percent of income earners rose from 38 to 47 percent. Over the same period, China's GINI coefficient rose from .29 to .42.<sup>1</sup> Some studies suggest that income inequality may be even higher than the level reported by the World Bank.<sup>2</sup>

The scale and trend in inequality have been major catalysts for empirical research and scholarly and policy debate, but with few exceptions, neither the implications of high levels of inequality for children's welfare in general nor the challenges presented by high levels of inequality for equality of educational opportunity have received much direct empirical scrutiny. Research elsewhere suggests that the implications could be profound. For example, the United States has experienced rising inequality since the 1970s. McLanahan's 2004 Presidential Address to the Population Association of America raised alarms about the divergent welfare destinies of children in recent decades: access to resources such as monetary investments and parental involvement has increased over time for those born to the most-educated women in America, while those born to the least-educated women have experienced a decline in access to resources at home, in part due to changing family formation patterns among this group.<sup>3</sup> Educational research raised similar concerns: expanding income gaps between the rich and poor since the 1970s have coincided with a dramatic rise in the achievement gap between children at the 10<sup>th</sup> and 90<sup>th</sup> percentiles of the income distribution.<sup>4</sup> During this period, not only were poor children falling behind, but the highest-income children were pulling far ahead, in outcomes ranging from achievement to household enrichment expenditures to college attendance to selective college attendance.<sup>5</sup>

In China, despite levels of inequality and migration-related family disruption that are unprecedented in recent history, few studies have investigated the divergent destinies of children in affluent and poor families. In this paper, we draw on two recent, nationally representative surveys—the China Family Panel Studies (2012 wave) and the China Education Panel Survey (2013-2014 baseline wave)—to investigate the implications of childhood inequality in China for child welfare. We compare family environments and welfare outcomes of children in the least socioeconomically advantaged households, in middle groups of households, and in the most socioeconomically advantaged households. For each dimension of family

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<sup>1</sup> Development Research Group 2015.

<sup>2</sup> Xie and Zhou 2014.

<sup>3</sup> McLanahan 2004.

<sup>4</sup> Reardon 2011.

<sup>5</sup> Ibid; Duncan and Murnane 2011; Reardon, Baker, and Klasik 2012; Bailey and Dynarski 2011.

environment, and for each welfare outcome, we address the following research questions: Are there significant differences between the three groups? Do children with low socioeconomic status fall behind children with middle and high socioeconomic status on certain measures? Do children with high socioeconomic status pull ahead of the rest on other measures?

## Framework

Child development scholars have variously conceptualized the impact of family socioeconomic status on child development,<sup>6</sup> but many emphasize two key mechanisms: family investments and family stress<sup>7</sup> (see Figure 1). Investments include monetary expenditures on tutoring, learning materials at home, parental involvement in the child's studies, and aspects of material well-being, such as shelter, food, medical treatment, and a safe and secure environment.<sup>8</sup> Examples of family stress include parental illness, parental substance abuse, strained relationships, domestic abuse, and family disruptions, such as marital dissolution or the death of a parent. Related to stress and investments is the concept of family social capital, which suggests that children benefit more from the "human capital" of their parents when their parents are present; parents are close to and interact with children; parents supervise children and convey high expectations to them; parents help children with educational problems; and parents are networked into the institutions that matter for child welfare outcomes in the local context.<sup>9</sup> In the U.S., changing family formation patterns have led to the rise of single parent households and "fragile" families, and this trend is pronounced among children of mothers with lower levels of education.<sup>10</sup> Consequently, families with lower socioeconomic status may have fewer adults available for supervision, competent investment, and the kind of "concerted cultivation" of children that is practiced in middle-class American homes.<sup>11</sup> Social capital available to a child can also be reduced by stressors such as family migration, transferring schools, or living away from home.<sup>12</sup> In the U.S., Gershoff et al. (2007) found a positive relationship between income and family investments and a negative relationship between income and exposure to family stress and material hardship. The authors also identified family investments as mediators in the relationship between household socioeconomic status and educational outcomes. Finally, poverty had negative implications for behavioural outcomes.<sup>13</sup> Drawing on these ideas, we developed the

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<sup>6</sup> Adler and Ostrove 1999; Guo and Harris 2000; Yeung, Linver, and Brooks-Gunn 2002; Conger and Donnellan 2007.

<sup>7</sup> Conger and Donnellan 2007, 181.

<sup>8</sup> Ibid; Lareau 2011.

<sup>9</sup> Coleman 1988; Buchmann 2002; Bankston and Zhou 2002, among others.

<sup>10</sup> McLanahan 2004.

<sup>11</sup> Lareau 2011.

<sup>12</sup> Coleman 1988; Hagan, MacMillan, and Wheaton 1996.

<sup>13</sup> As cited in Hannum and Xie 2016, 471.

conceptual framework in Figure 1 to guide an investigation of socioeconomic differences in family environments and children's welfare outcomes in China.

## China context

Despite recent attention to the issue of rising inequality in China, implications for the educational outcomes of children and child welfare in general have not yet been fully explored. However, there are several related lines of work. Regarding physical health, a few studies have explored the implications of socioeconomic inequality in China for the nutrition status of children. Scholars have observed, for example, high child obesity rates among the affluent and a high incidence of underweight children among the poor.<sup>14</sup> Health disparities may be associated with differential access to health-related resources at home. Adams and Hannum (2005), for example, found a positive relationship between household socioeconomic status and children's access to health insurance. To our knowledge, no sociological or economic studies have investigated disparities in psychosocial health associated with economic inequality, though studies<sup>15</sup> and a recent government white paper<sup>16</sup> have investigated behavioural and mental health issues affecting children facing family disruption through migration.

Regarding education, many studies have investigated how poverty and economic disadvantage affect educational outcomes, with particular attention to rural poverty, which continues to be a major risk factor for school dropout.<sup>17</sup> Children in poor rural areas can face deprivations at a very basic level, including chronic undernourishment, food insecurity, lacking access to vision correction, and experiencing parental absence due to migration.<sup>18</sup> These deprivations have been linked empirically to various educational disadvantages.<sup>19</sup> Interviews in Gansu Province indicated that children in poor rural communities lack essential school materials and adults at home who have educational experience to assist with homework or school problems; they express generalized distress about money and the burden of school costs on their parents.<sup>20</sup> Poor rural children may be "behind before they begin" as their parents can afford fewer expenditures on early childhood education, even before beginning compulsory basic education.<sup>21</sup> A study analysing the multi-province China Health and Nutrition Survey revealed that even after

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<sup>14</sup> Yi et al. 2012.

<sup>15</sup> Gao et al. 2010; Wen and Lin 2012.

<sup>16</sup> "Zhongguo liushou ertong" 2016.

<sup>17</sup> Yi et al. 2012.

<sup>18</sup> Yu and Hannum 2007; Hannum and Zhang 2012; Wen and Lin 2012; Hannum, Liu, and Frongillo 2014, among others.

<sup>19</sup> Jamison 1986; Yu and Hannum 2007; Luo, Shi, et al. 2012; Wen and Lin 2012; Hannum, Liu, and Frongillo 2014, among others.

<sup>20</sup> Hannum and Adams 2009.

<sup>21</sup> Luo, Zhang, et al. 2012.

controlling for long-term income, children who experienced poverty in early childhood had an elevated probability of dropping out of school.<sup>22</sup>

While there has been much scholarly attention to the education-related disadvantages associated with poverty, a smaller body of literature has explored differences between Chinese children from different socioeconomic groups in educational resources and outcomes. Regarding educational attainment, Adams and Hannum (2005) found that school enrolment gaps between poor and affluent children persisted between 1989 and 1993 despite educational expansion and Magnani and Zhu (2015) observed that the correlation between the educational attainment of parents and their children increased between 1990 and 2000. A handful of studies have also investigated whether gaps exist between children from different social classes in access to educational resources, such as monetary investments, parental involvement, and access to cultural capital at home. Chi and Qian (2016) found that both highly educated and high-income parents in urban areas spend more on out-of-school educational expenditures than do less educated and low-income parents. Drawing from a dataset of 3,087 urban residents, Wu (2008) identified cultural capital at home as one mediator of the relationship between household socioeconomic status and educational outcomes in urban China. Finally, Liu and Xie (2015) documented a positive relationship between parenting practices and educational performance, although they did not find evidence of a relationship between income and parenting practices. Nevertheless, the previous literature on socioeconomic disparities in educational resources is limited. Both Wu (2008) and Chi and Qian (2016) focused exclusively on urban areas in their analysis, and research on socioeconomic disparities in parenting has, until now, been limited by the lack of nationally representative data with extensive information about parenting practices.

It is important to add to the emerging literature on childhood inequality for two reasons. First, while rural poverty remains an important problem in China, issues of urban poverty and inequality have become increasingly pressing with the rise of migration and emergence of a disadvantaged urban migrant class. One recent estimate indicates that the migrant population numbered 253 million by the end of 2014 – about one sixth of China’s total population – and is expected to reach 291 million in 2020. This projected number includes 220 million rural-to-urban migrants.<sup>23</sup> Of particular relevance to this paper are the implications migration has had for family environments. According to 2010 census figures, over 61 million children ages 0 to 17 were “left-behind” (*liushou ertong* 留守儿童).<sup>24</sup> Close to half were left behind by both parents, 36 percent experienced absence of a migrant father, and 17 percent had a migrant mother. Thirty-eight percent of all rural

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<sup>22</sup> Liu and Hannum 2017.

<sup>23</sup> Chinadaily.com.cn. 2015. “China’s migrant population expected to reach 291m by 2020,” November 12, [http://usa.chinadaily.com.cn/china/2015-11/12/content\\_22441628.htm](http://usa.chinadaily.com.cn/china/2015-11/12/content_22441628.htm).

<sup>24</sup> Zhou, Murphy, and Tao 2014, 273.

children and 22 percent of the general population of children are left-behind.<sup>25</sup> In addition, a smaller but growing fraction of children are brought along with their migrant parents<sup>26</sup> and experience uncertain access to schools and services in urban areas and may be part of an emerging vulnerable and poor urban population.<sup>27</sup> Migration can also affect family structure and family ties, which may have implications for childhood inequality.<sup>28</sup>

A second reason to focus on inequality in childhood is the relatively recent emergence of an affluent class in China. This change highlights the need for a shift in focus to consider the advantages of the elite, as well as the disadvantages of the poor, as critical elements of inequality in childhood. As an illustration of this point, a McKinsey report highlighted a projected emerging middle and affluent class in China whose consumption is expected to grow substantially in the future.<sup>29</sup> This consumption extends to education for children.<sup>30</sup> The advantages of the wealthy are just beginning to be studied in the context of large-scale survey based studies in China. Beyond looking at parental education and income effects on education, few studies have considered the advantages of children from affluent families.

To summarize, prior research on childhood inequality in China suggests that socioeconomic inequality may translate into inequalities in children's nutrition status, access to healthcare and educational resources at home, and educational outcomes. A number of studies have focused on poverty and socioeconomic deprivation in education and child welfare, and many of these studies have focused on issues of rural poverty. Although rural poverty remains a serious challenge to children's welfare in China, urbanization, migration and the emergence of both marginalized and affluent urban populations have changed the scale and nature of inequality in childhood and call for further study. While a number of studies have begun to investigate the implications of migration for children's schooling and welfare, these studies have not placed migration in the context of a broader investigation of family socioeconomic status. Further, few studies have considered the advantages of children of China's emerging affluent classes. Drawing on a framework of family investments and family stress and comparing children in "middle" socioeconomic groups to those of high and low socioeconomic status, the current paper begins to address these gaps in the literature.

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<sup>25</sup> Ibid.

<sup>26</sup> "Report on rural left-behind children" 2013.

<sup>27</sup> Liang and Chen 2007; Chen and Feng 2013.

<sup>28</sup> Coleman 1988; Hagan, MacMillan, and Wheaton 1996.

<sup>29</sup> Barton, Chen, and Jin 2013.

<sup>30</sup> Liu 2016.



## Data and methods

### *Data*

Because no single data source is ideal for our purposes, we make use of two newly available national-scale datasets that are different in sample and focus but mutually complementary: the China Family Panel Studies (CFPS) and the China Education Panel Survey (CEPS). CFPS is a household survey that includes detailed information on children ages 0-15, while CEPS focuses on seventh and ninth graders (ages 12-16) currently enrolled in school. Critically for our purposes, CFPS contains detailed income and expenditure data, while CEPS contains extensive information on parenting practices. By drawing on both datasets, we are able to capitalize on the strengths of each.

The 2012 wave of CFPS is a nationally representative sample of 13,315 households and 35,719 adults (ages 16 and above) and 8,621 children (ages 0 to 15) living within the sampled households.<sup>31</sup> We use data collected during the second wave, since the data collection period of this wave corresponds more closely to that of our second dataset. When using family income as our measure of socioeconomic status, we restrict analysis to the 8,264 children (ages 0 to 15) not missing data on net family income per capita in 2012. We restrict analysis to the 8,576 children not missing data on either father's education or mother's education when using parental education as our SES measure.

The baseline (2013-2014) wave of CEPS is a nationally representative sample of 112 schools, 438 classrooms within schools, and 19,487 seventh and ninth-graders (ages 12 through 16) within classrooms.<sup>32</sup> In addition to the students, school administrators, teachers, and a parent or guardian of each sampled student completed questionnaires. As with CFPS, in producing descriptive statistics we restrict analysis to children not missing data on the given measure of socioeconomic status. 19,007 children are included in analysis when using parental education as our measure of socioeconomic status, while analysis is restricted to 19,475 children when using a household assets scale as our measure.<sup>33</sup>

### *Measures of socioeconomic status*

The two datasets do not contain the same information about family socioeconomic status. We were able to construct one common measure of family SES based on parental education, which is reported in both datasets, and one

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<sup>31</sup> Additional information about CFPS can be found at the following website:

<http://www.issp.pku.edu.cn/cfps/EN/>

<sup>32</sup> Additional information about CEPS can be found at the following website:

<http://www.chinaeducationpanelsurvey.org/index.php?r=index/index&hl=en>

<sup>33</sup> Since CEPS is a school-based survey, the sampling frame does not cover students who drop out of school before seventh grade. Although the number of students dropping out at the compulsory-level of schooling is thought to be low, the estimated socioeconomic disparities produced using CEPS may be conservative, given this feature of the dataset.

unique measure: based on income for CFPS and based on household assets for CEPS (because the CEPS dataset does not contain information on family income).

We use data on parental education in CEPS and CFPS to divide children into three groups – high parental education (high SES), low parental education (low SES), and “middle” parental education (“middle” SES). High parental education is defined as having at least one parent with post-secondary education. Low parental education is defined as lacking a parent with education beyond elementary school. “Middle” parental education is defined as not falling into either of the other categories. Within CEPS, 13.65 percent of the nationally representative sample is classified as low parental education, 74.71 percent as “middle” parental education, and 11.63 percent as high parental education. Within CFPS, 21.08 percent of the nationally representative sample is classified as low parental education, 67.25 percent as “middle” parental education, and 11.67 percent as high parental education.

Family income (available only in CFPS) is operationalized as net family income per capita in 2012. We generate income quintiles to compare high SES families and low SES families to “middle” families. We define high SES families as those within the top quintile of the income distribution, “middle” families as those in the three middle quintiles (the middle 60 percent), and low SES families as those within the bottom quintile.

Due to lack of direct measurement of income in the CEPS dataset, a scale of household assets is employed as a second measure of SES. Asking children or adolescents to report family income often results in high levels of missingness and/or bias.<sup>34</sup> Instead, scholars have proposed the adoption of household assets scales to measure socioeconomic status in child or adolescent surveys.<sup>35</sup> Some researchers use an assets index as a linear measure of wealth,<sup>36</sup> although others have expressed concern that these indices are often lengthy, which can pose a problem, as children may not have full information about their household possessions.

An alternative approach is the Family Affluence Scale (FAS) developed by the research team of the Health Behaviour in School-Aged Children: WHO Collaborative Cross-National Study (HBSC). The questions that constitute the cross-national Family Affluence Scale are quick and easy for children to answer. The second version of the scale, FAS II, for example, is based on whether the family owns a car, the number of computers at home, whether the child has her own bedroom, and the frequency of family vacations. Liu et al. found FAS II to be a valid measure of SES within certain Chinese contexts.<sup>37</sup>

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<sup>34</sup> Currie et al. 2008.

<sup>35</sup> Abramson et al. 1982; Filmer and Pritchett 2001; Currie et al. 2008, among others.

<sup>36</sup> Filmer and Pritchett 2001.

<sup>37</sup> Liu et al. 2011; The most recent version of FAS has not been tested in China.

Although not strictly a household assets scale, the Economic, Social and Cultural Status (ESCS) index employed by PISA also includes a set of questions about home possessions. Students are asked if they possess a desk, their own bedroom, a study space, a computer, Internet access, educational software, a calculator, classic works of art or literature, books, a dictionary, and a dishwasher at home. Children are also asked to list the number of books their family possesses. Other researchers argue that simply asking children about the number of books at home is a valid and useful measure of socioeconomic status.<sup>38</sup>

We use a household assets scale based on the reviewed scales as our second measure of socioeconomic status in CEPS. Although we would have liked to replicate FAS II, the student questionnaire did not include information about family vacations or whether the child had her own bedroom. Instead, the following assets are included in our scale: access to a computer and/or Internet at home, the relative number of books in the household (Coded 1=Very few; 2=Relatively few; 3=A normal amount; 4=Many; 5=A lot), and whether the child has access to their own desk at home. Our scale has a Cronbach's alpha of 0.66 and factor analysis suggests that the scale is unidimensional. Higher values on the scale indicate higher socioeconomic status. We generate quintiles for the household assets scale to compare high SES families and low SES families to "middle" families. We define high SES families as those within the top quintile of the scale, "middle" families as those in the three middle quintiles (the middle 60 percent), and low SES families as those within the bottom quintile.

### *Family environment measures*

We draw on the CFPS parent questionnaire, which includes questions about annual expenditures on education-related items for the child, to consider socioeconomic disparities in monetary investments. We use both CFPS and CEPS to examine SES differences in enrolment in tutoring (CFPS provides data on tutorial enrolment among 0-15 year olds, while CEPS provides data for seventh and ninth graders).

We also use CEPS to investigate measures of parental involvement in education. We look at student reports of how frequently their parents checked or provided guidance on their homework in the past week; parent reports of attendance at parent-teacher meetings; and student reports of how frequently they read with their parents or accompanied them to museums or other cultural institutions in the past year.

Variables related to family stress come from CEPS and include measures of parental absence, the child's migrant status, whether the child transferred primary schools, and whether the child boards at school. Parental absence is measured via two dummy variables, one for an absent mother (coded 1 if the student does not

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<sup>38</sup> Raudenbush, Cheong, and Fotiu 1996.

select “mother” when asked, “in your current home, with whom do you live?”), and one for an absent father (coded 1 if the student does not select “father” when asked, “in your current home, with whom do you live?”). Finally, parents filling out the parent questionnaire reported their current health status.

### *Measures of welfare outcomes*

Physical health-related variables include a measure of self-rated health in CEPS (CEPS: “how is your overall health currently?” Coded 1=Very poor; 2=Poor; 3=Average; 4=Relatively healthy; 5=Very good), and measures of illness in early childhood and disability in the CEPS dataset (visual impairment other than near-sightedness, hearing impairment, physical disability, speech impairment, autism or other mental disorder, ADHD, other).

Our first measure of psychosocial health is a CES-D scale administered by the CFPS research team to all sampled children ages 10 to 15. The Center for Epidemiological Studies Depression Scale (CES-D) is one of the most widely used screening tests for depression in the world; previous research suggests that it is a valid and reliable measure of depression not only in the U.S. and other Western societies,<sup>39</sup> but also in China.<sup>40</sup> The instrument has high reliability in the CFPS sample of children (Cronbach’s alpha=0.809). CEPS uses a much shorter, five-item scale to measure unhappiness or depression among seventh and ninth graders. We use this as a secondary measure of psychosocial health. Although we do not have information on validity or psychometric properties of this scale in other populations in China, the reliability in the CEPS sample is high (Cronbach’s alpha=0.80).<sup>41</sup>

Our measure of educational performance is a standardized test of logical reasoning administered by the CEPS research team.<sup>42</sup> The test consists of 20 items for seventh graders and 22 items for ninth graders. Similar to other psychometric tests used in international education research, the CEPS test measures student reasoning across three dimensions: language, math, and graphical forms.<sup>43</sup> The CEPS research team used the three-parameter logistic (3PL) IRT model to derive final test scores.<sup>44</sup> Item Response Theory (IRT) is a well-regarded, common approach to psychometric test design and evaluation in the education field.<sup>45</sup> To derive final test scores, the 3PL IRT model takes into consideration the difficulty of

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<sup>39</sup> Radloff 1977.

<sup>40</sup> Zhang and Norvilitis 2002; Zhang et al. 2010; Luo and Wu 2014.

<sup>41</sup> Although we are unaware of formal validation of this measure in China, one former study found, as expected, that left-behind children have much higher scores on the scale than other children (Xu, Dronkers, and Wu 2016).

<sup>42</sup> We considered using a number series test and a word test in CFPS as additional measures of, educational performance. The number series test, however, has high levels of missingness, while the word test was designed to measure memory retrieval rather than logical reasoning. Moreover, we could find little information about design, reliability and validity of the word recall test.

<sup>43</sup> Zhao et al. 2017.

<sup>44</sup> The distribution shows stable psychometric properties (Hao and Yu 2017); the 3PL test scores are approximately normally distributed.

<sup>45</sup> Hambleton, Swaminathan, and Rogers 1991

each item, the ability of each item to discriminate among respondents with different ability levels, and the probability that a respondent correctly guesses the answer to the item.<sup>46</sup> The test has high reliability in the CEPS sample (Cronbach's  $\alpha=0.69$  for seventh graders;  $0.72$  for ninth graders). We use standardized scores on this test to measure educational performance.

### *Methodological approach*

To produce figures depicting family inequalities, we regress investment, stress and welfare outcome measures on each measure of socioeconomic status.<sup>47</sup> For the CFPS dataset, we add controls for gender, age, and the month during which the household completed the survey. For the CEPS dataset, we adjust for gender, grade, and the semester during which the student completed the survey. We estimate OLS regression models for continuous dependent variables. In the case of categorical dependent variables, we first dichotomize the variable and then estimate a logistic regression model of the log odds of falling into one category of the dichotomized variable.<sup>48</sup> Using these specifications and setting covariates at mean values, we calculate predicted values (for each continuous outcome) or predicted probabilities of falling into a given category (for categorical outcomes) for high SES children, middle SES children, and low SES children.

We test whether the group differences are statistically significant. First, we test the null hypothesis that there are no differences between any of the three socioeconomic groups in the dependent variable of interest. We use an F-test for continuous dependent variables and a chi-square test for dichotomous dependent variables ( $\alpha=0.05$ ). If the evidence is sufficient to reject the null hypothesis, we perform a series of post-hoc, pair-wise comparisons of the three SES groups on the dependent variable. We use the Bonferroni correction for multiple comparisons to set the family-wise error rate (FWER) at five percent.

## **Analysis and results**

### *Family investments*

We first consider whether high, middle, and low SES families differ in monetary investments in children's education. Figure 2.1 shows the predicted educational expenditures of families within each of three socioeconomic groups. These groups are defined by parental education in the top part of Figure 2.1 and by

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<sup>46</sup> Wang and Li 2015

<sup>47</sup> Since CEPS and CFPS employ multi-stage cluster sampling, we use robust standard errors that adjust for within-cluster correlation. For CEPS, we adjust for clustering by school; for CFPS, we adjust for clustering by county. We also include sampling weights.

<sup>48</sup> Frequency of reading with the child, for example, is dichotomized as 1=the child's parent read with them at least once in the past year and 0=the child's parent never read with them in the past year.

income quintiles in the bottom part of Figure 2.1. Regardless of the measure of SES used, the predicted total educational expenditures of high SES families are very high relative to the other socioeconomic groups. The predicted total educational expenditures of high SES families are twice the predicted total educational expenditures of middle SES families and between 2.6 times (if we define SES by family income) and 4.6 times (if we define SES by parental education) the predicted total educational expenditures of low SES families. Hypothesis tests reveal that the differences in total educational expenditures between high and middle SES families and between high and low SES families are statistically significant. The gaps between middle and low SES families, however, are only statistically significant if we define SES by parental education.

Spending on tutoring is a major contributor to the overall gap in educational expenditures. The predicted expenditure on tutoring among high SES families is about four times that of families with “middle” socioeconomic status. Even more drastic are the gaps in predicted tutoring expenditures between high and low SES families: the ratio is 8:1 for high income families relative to low income families, and the predicted expenditure of highly educated parents is 1,256 RMB, compared to close to 0 RMB<sup>49</sup> for parents with low levels of education. Differences between high, middle, and low SES families on tutoring expenditures are all statistically significant.

While the predicted values produced using CFPS are for children ages 0 to 15, in Figure 2.2 we use CEPS to compare the predicted expenditure on tutoring among 12-16 year olds enrolled in school. Although the predicted values are different from those produced using CFPS,<sup>50</sup> the observed socioeconomic gaps are comparably large. Further, as in CFPS, the differences between the three SES groups are all statistically significant.

A key reason that expenditures on tutoring are higher among high SES families is that high SES children are more likely than other children to enrol in tutoring. The top half of Figure 3 shows the predicted probability of 0-15 year olds enrolling in tutoring in the month during which the family was interviewed, while the bottom half of Figure 3 shows the predicted probability of seventh and ninth graders enrolling in tutoring in the semester in which the survey was conducted. Again, we see stark disparities between low, “middle”, and high SES children, all of which are statistically significant.

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<sup>49</sup> Although Figure 2.1 shows a negative predicted value for tutoring expenditures among parents with low levels of education, the confidence interval crosses zero, indicating that tutoring expenditures for this group do not differ significantly from zero. (Note: we considered transforming right-skewed educational expenditure variables to constrain the predicted expenditures to take on only positive values. This approach does not significantly improve model fit, however, and complicates interpretation of predicted values and confidence intervals).

<sup>50</sup> Differences between CEPS and CFPS in predicted expenditures on tutoring may be due to differences in question wording, time frame, and differences between the survey samples in the age range and school enrolment status of surveyed children.

In contrast to Liu and Xie (2015), we also observe socioeconomic disparities in parenting practices (Figure 4). Notably, the dataset we use (CEPS) contains more extensive data on parenting practices than the CFPS dataset, which Liu and Xie used in their analysis. First, we observe socioeconomic differences in parental homework assistance and attendance at parent-teacher meetings.<sup>51</sup> These differences look quite similar across both measures of socioeconomic status and are statistically significant. High SES children are also more likely to read with their parents or accompany them to cultural institutions than middle or low SES children, activities that not only require cultural capital, but may also generate additional cultural capital. Hypothesis tests indicate that these differences are statistically significant.

### *Family stress*

In addition to disparities in family investments, the three socioeconomic groups differ in exposure to family stressors (Figure 5). Low SES children are more likely than other children to live with a sick parent: the predicted probability of having a parent in poor or very poor health is about 15 percent for low SES children, compared to eight percent for “middle” SES children and three percent for high SES children. Parental absence is also more common among the socioeconomically disadvantaged. Although children with highly educated parents have a 12 percent predicted probability of living without a father, the predicted probability of paternal absence is almost three times as high for children with low educated parents. Similar patterns are observed if we use assets quintiles to measure socioeconomic status or if we compare predicted probabilities of living without a mother. These observed differences between low, middle, and high SES children in parental health and parental absence are all statistically significant.

Disparities are observed in at least three other types of family stressors. First, we observe disparities in the likelihood of living at school during the week, a living situation that may weaken family ties and deplete social capital. The predicted probability of boarding at school is 63 percent for children with low educated parents, 47 percent for children with “middle” educated parents, but only 12 percent for children with highly educated parents. The patterns are similar if we measure SES with the household assets scale, and all socioeconomic differences in exposure to this stressor are statistically significant. A second stressor is whether children transferred primary schools, an event scholars have associated with the depletion of social capital.<sup>52</sup> The predicted probability of transferring primary schools is about 41 percent for low SES children and 33 percent for middle SES children, compared to 20 percent for high SES children. These differences are all statistically significant. There does appear to be one exception to the trend of low

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<sup>51</sup> We restrict analysis of attendance at parent-teacher meetings to families whose school held a parent-teacher meeting prior to the survey.

<sup>52</sup> Coleman 1988; Hagan, MacMillan, and Wheaton 1996.

SES children having a higher probability of experiencing family stress than other children. Children with low educated parents are no more likely to be migrants (eight percent) than are children with highly educated parents (seven percent), while children in the bottom assets quintile are less likely to be migrants (five percent) than those in the top assets quintile (11 percent).

### *Welfare outcomes*

We have revealed stark disparities between children from different socioeconomic groups in access to resources related to child development and education. These disparities lead us to ask whether children with different socioeconomic status experience different welfare outcomes. We first consider socioeconomic differences in physical health (Figure 6), using three measures: self-rated health, serious illness in childhood, and physical or mental impairments. Within CEPS, the predicted probability of reporting poor self-rated health (Figure 6.1) is higher among low SES children than among either middle or high SES children. There is no statistically significant difference between middle and high SES children on this measure.<sup>53</sup>

Low SES children are also more likely to have had a serious childhood illness than other children (Figure 6.2). The predicted probability of experiencing serious illness before elementary school is about 18 percent for low SES children, compared to ten percent for middle SES children and six percent for high SES children. In addition, low SES children are more than twice as likely to have an impairment compared to high SES children (Figure 6.3). Hypothesis tests indicate that all of the pair-wise differences between the SES groups on these two measures of physical health are statistically significant.

Low SES children are more likely than other children to experience not only physical health problems, but also psychosocial health problems (Figure 7). The predicted CES-D score for 10-15 year old children with low educated parents is about half a standard deviation higher than children with highly educated parents (Figure 7.1A). This difference is significant, as is the difference between children in the bottom and top income quintiles. We next use scores on the CES-D scale to calculate predicted probabilities of exhibiting evidence of depression for each socioeconomic group (Figure 7.2). We find that low SES children are about two to three times more likely than high SES children to exhibit some evidence of depression (as indicated by a CES-D score of 16 or higher); this difference is statistically significant. In addition to the CES-D scale in CFPS, we investigate differences on the CEPS psychosocial problems module. As shown in Figure 7.1B, low SES children again have a higher predicted score on this module than middle SES children, who have a higher predicted score than high SES children.

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<sup>53</sup> Although CFPS also includes a measure of self-rated health, only 33 children reported their current health status as “poor” or “very poor.” It is inadvisable to estimate a logit model when so few cases fall into the Y=1 value of the dependent variable.



Additional analyses indicate that all pair-wise differences are statistically significant.

Finally, to investigate disparities in educational performance, we look at a standardized test of logical reasoning (CEPS). Predicted scores on the test for seventh graders with high, middle, and low socioeconomic status are presented in the top half of Figure 8, while predicted scores for ninth graders are shown in the bottom half of the figure. We observe socioeconomic differences in test scores for both grades. Seventh grade students with highly educated parents, for example, have a predicted score of 0.34, compared to -0.17 for seventh graders with “middle” educated parents and -0.44 for seventh graders with low educated parents. All pairwise differences in test scores are statistically significant, regardless of SES measure.

## Conclusions and implications

In this paper, we have traced socioeconomic disparities in the family environments and welfare outcomes of children in China. The overall pattern of inequality that we observe suggests that, for most measures of family environment and welfare outcomes, high SES children fare best, low SES children fare worst, and “middle” SES children fall about equidistant between the other two groups. But there are also domains where the key distinction appears to be high SES versus other children, and where the key distinction seems to be low SES versus other children. For example, high SES children are well ahead of the rest in terms of education-related monetary investments, including expenditure on extracurricular tutoring. For these measures, the differences between the predicted expenditures of high and middle SES children are larger than the differences between “middle” and low SES children. In some cases, there is no statistically significant difference between middle and low SES children. In addition to educational expenditures, high SES children “pull ahead” of the rest on a measure of educational performance. For example, the gap in predicted scores on a test of logical reasoning between ninth graders with highly educated parents and ninth graders with “middle” educated parents is more than twice the size of the test score gap between ninth graders with low educated parents and ninth graders with “middle” educated parents. In contrast, reflecting the on-going child welfare challenges among families in poverty, children from low SES families fall far behind the rest on two measures of physical health: self-rated health and serious illness in childhood.

Our findings suggest that both emerging affluence and emerging economic inequalities in China are reflected in the family environments and welfare outcomes of children. To contextualize these findings, it is important to note that socioeconomic status intersects with other domains of stratification, in ways that may reinforce opportunity gaps. For example, in the United States, poverty and affluence intersect in important ways with race, ethnicity, and immigration status. In China, socioeconomic status may intersect with household registration type (*hukou* 户口), region of residence, ethnic minority status, whether one is a native speaker of Mandarin, and whether one lives in an urban area, and these other

factors may carry implications for children's life chances. For example, CEPS data show that ethnic minorities and non-native Mandarin speakers are overrepresented among low SES students. Low SES students are also less likely than middle and high SES students to live in the most developed area of China – China's eastern region; and Han Chinese (*han zu* 汉族), non-agricultural *hukou* 户口 holders, and residents of China's eastern region are overrepresented among high SES students. An important caveat to our findings is that family socioeconomic inequalities are shaped by and intersect with the broader contexts in which families operate.

Our findings raise two important considerations for policymakers. First, our findings speak to the continuing challenges to child welfare facing poor families. In recent years, the Chinese government has introduced new initiatives to lift poor families out of their disadvantaged social position. In 2016, Xi Jinping 习近平 stated that a variety of programs would be implemented to raise ten million people out of poverty each year, with the goal of eradicating poverty by 2020.<sup>54</sup> Poverty alleviation efforts include programs to expand low-income families' access to medical treatment, services, and insurance. Given our finding that low SES children fall far behind other children on measures of physical health, this particular initiative is quite promising.

Second, though poverty alleviation efforts constitute an important component of addressing childhood inequality, another element of inequality that they will not address is the advantages of children in an emerging affluent class. Our findings indicate that inequality is driven by the advantages of affluence as well as by the continuing disadvantages of poverty, and the advantages that distinguish high SES children from those in the middle are in some cases different from the disadvantages that distinguish low SES children from those in the middle. As our study has shown, high SES families in China are heavily investing in their children's education by purchasing education-related goods and services outside of the school system. This investment in education may in part explain why high SES children "pull ahead" of the rest in educational performance, and will likely have higher levels of educational attainment, better job opportunities, and higher salaries. Similar to the situation of the United States and other countries facing high levels of economic inequality, family inequalities outside of the purview of China's educational system present a complex challenge to ideals of equality of educational opportunity.

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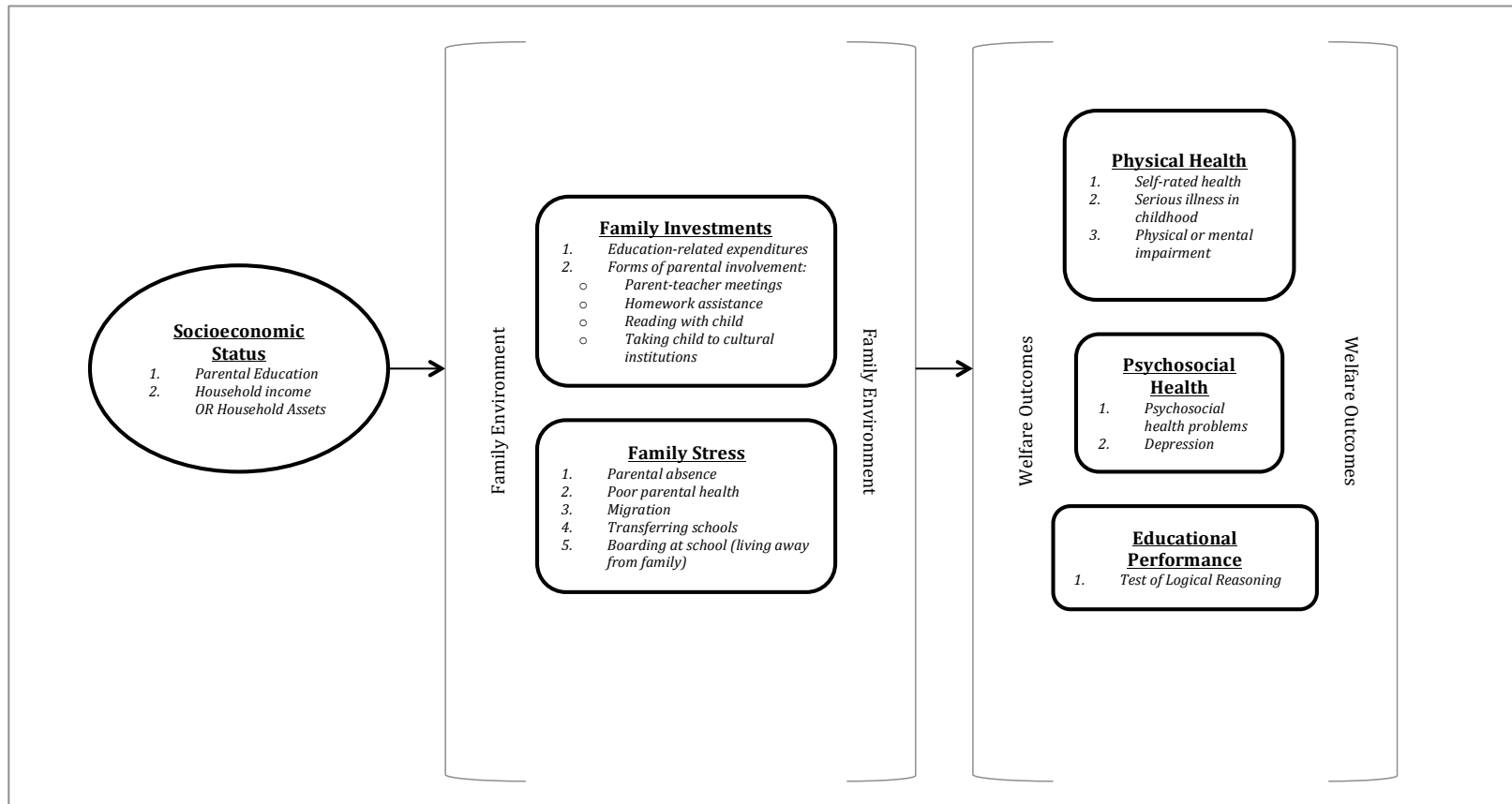
<sup>54</sup> "Zhongguo de jian pin xingdong" 2016.

## Tables and figures

*Table 1: Descriptive statistics for two samples*

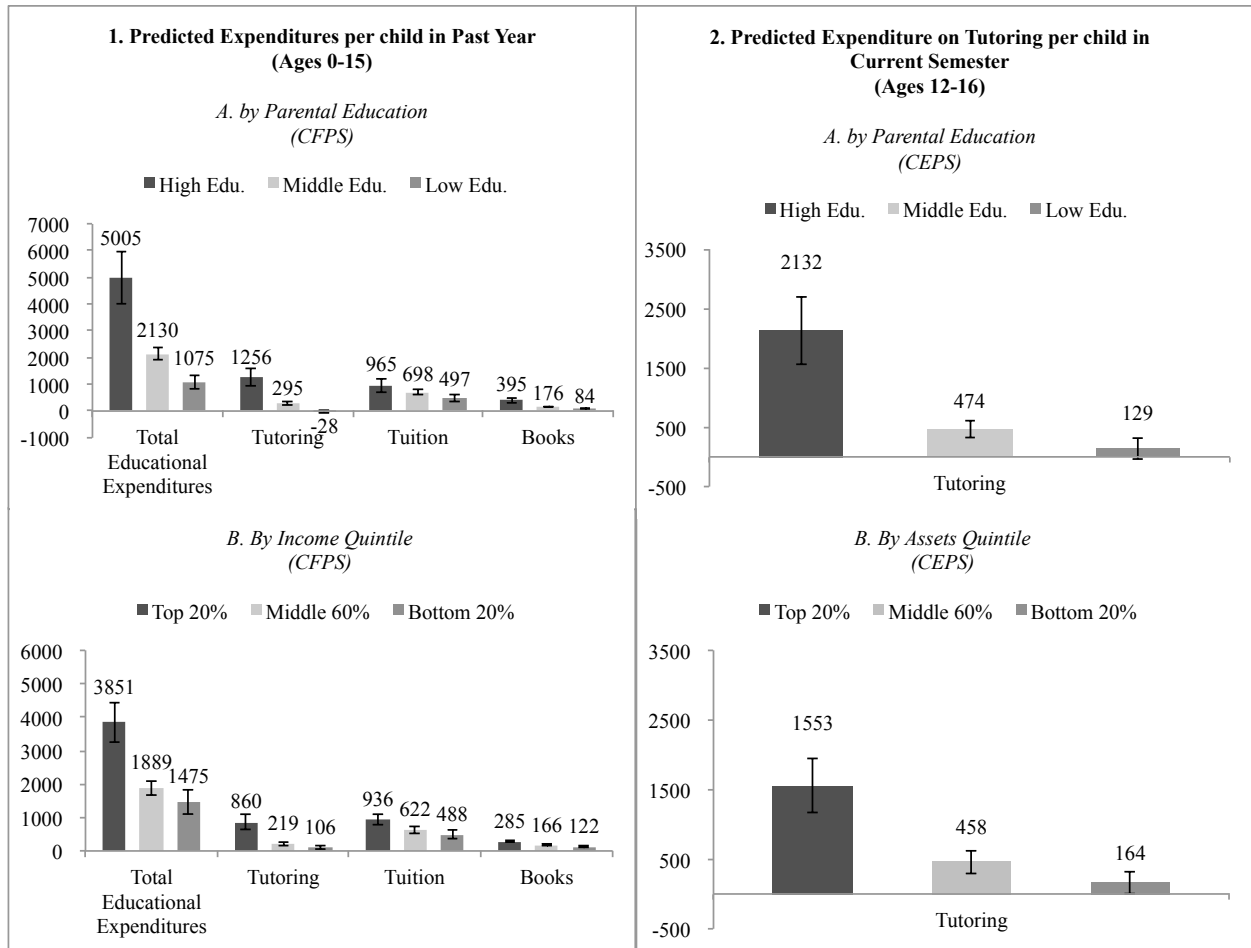
China Family Panel Studies (with sampling weights)		China Education Panel Survey (with sampling weights)	
Variable	Mean or %	Variable	Mean or %
Male (%)	52.27	Male (%)	52.94
Age	7.65	Age	13.86
Household in urban area (%)	41.89	Attends school in urban area (%)	48.87
Agricultural <i>hukou</i> 户口(%)	75.84	Agricultural <i>hukou</i> 户口(%)	64.23
Migrant (%)	12.62	Migrant (%)	10.16
Enrolled in school (%)	71.82	Ethnic minority (%)	15.22
Region		Region	
East (%)	42.92	East (%)	42.84
West (%)	29.00	Middle (%)	31.66
Middle (%)	28.08	West (%)	25.50
Sample size	8,576	Sample size	19,487

Figure 1: Conceptual framework: Family influences on child outcomes



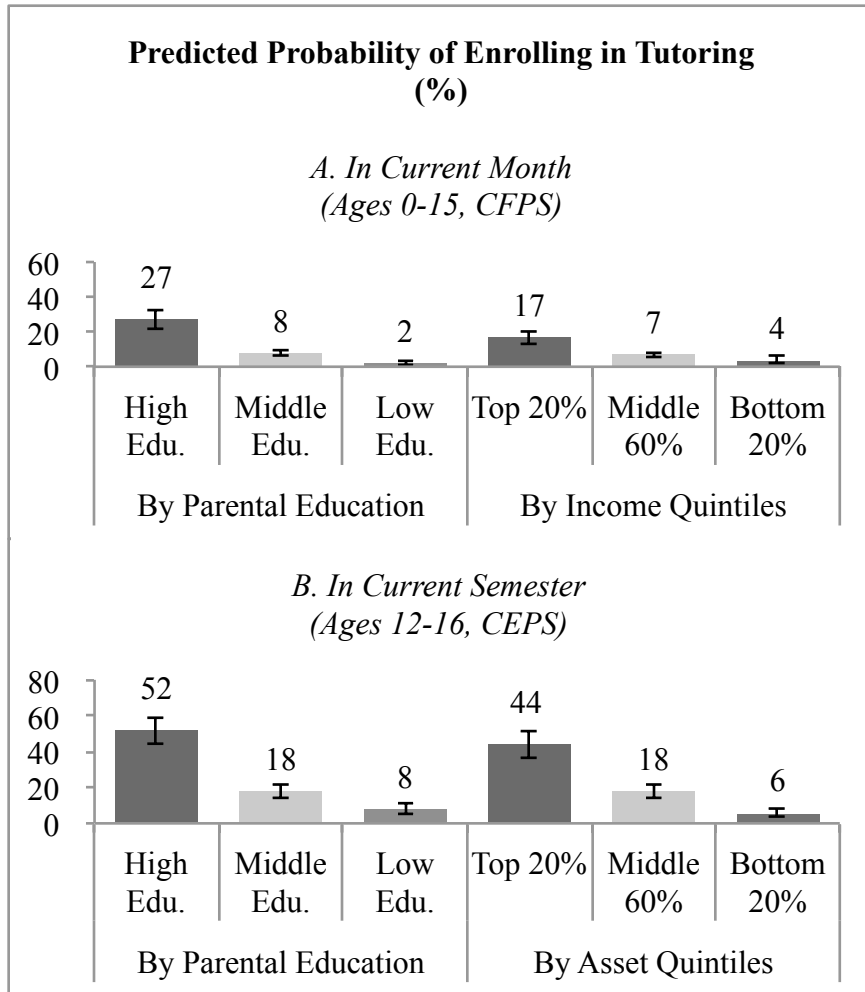
Note: Although other contextual factors are important for child outcomes (e.g. schools; neighbourhoods), this conceptual framework only concerns how families affect child outcomes. In addition, while family environment is depicted as a mediator in our conceptual framework, we are not addressing the mediation question in this paper, due to data limitations.

Figure 2: Education-related monetary investments



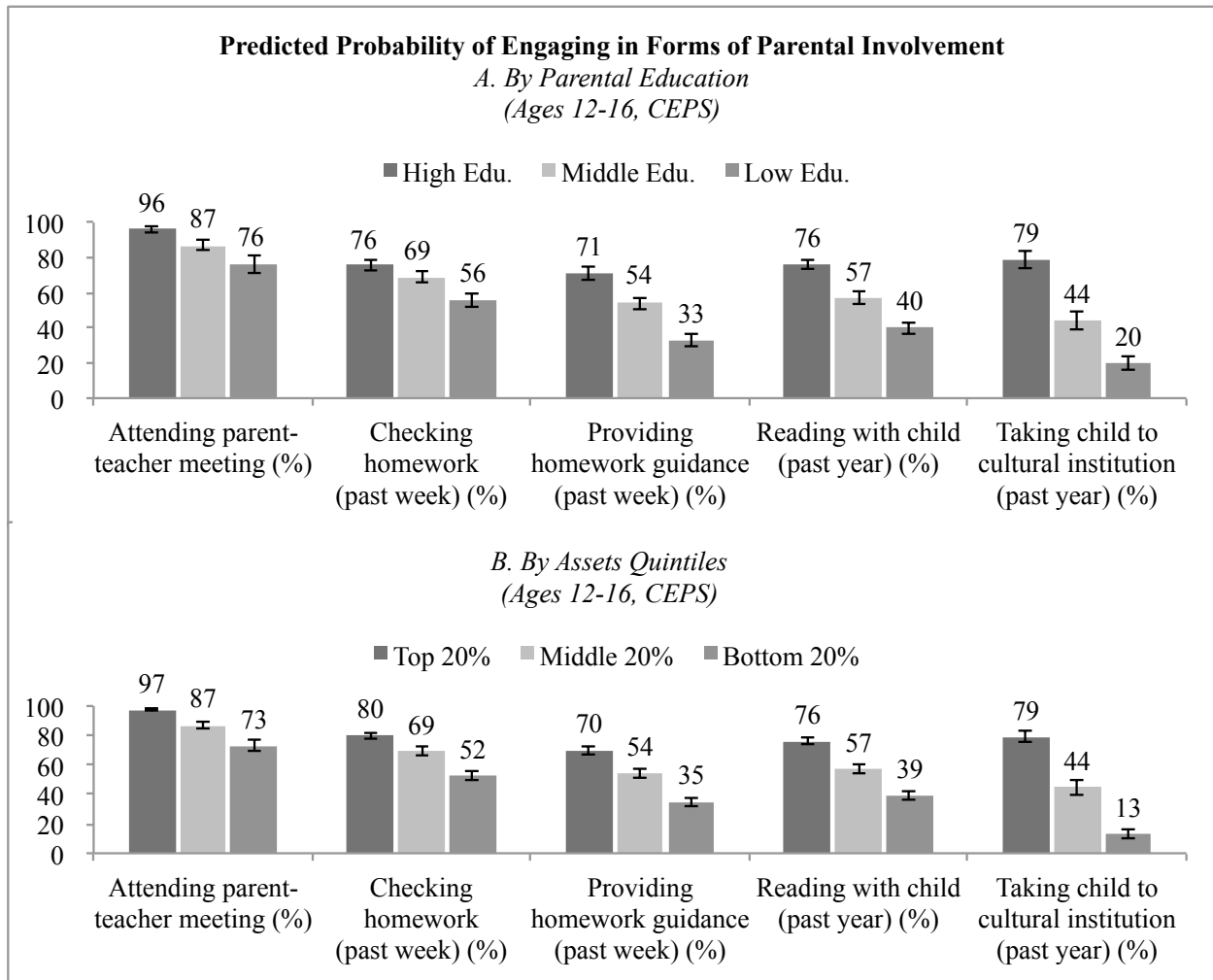
Reported in RMB with 95 percent confidence intervals.

Figure 3: Participation in tutoring



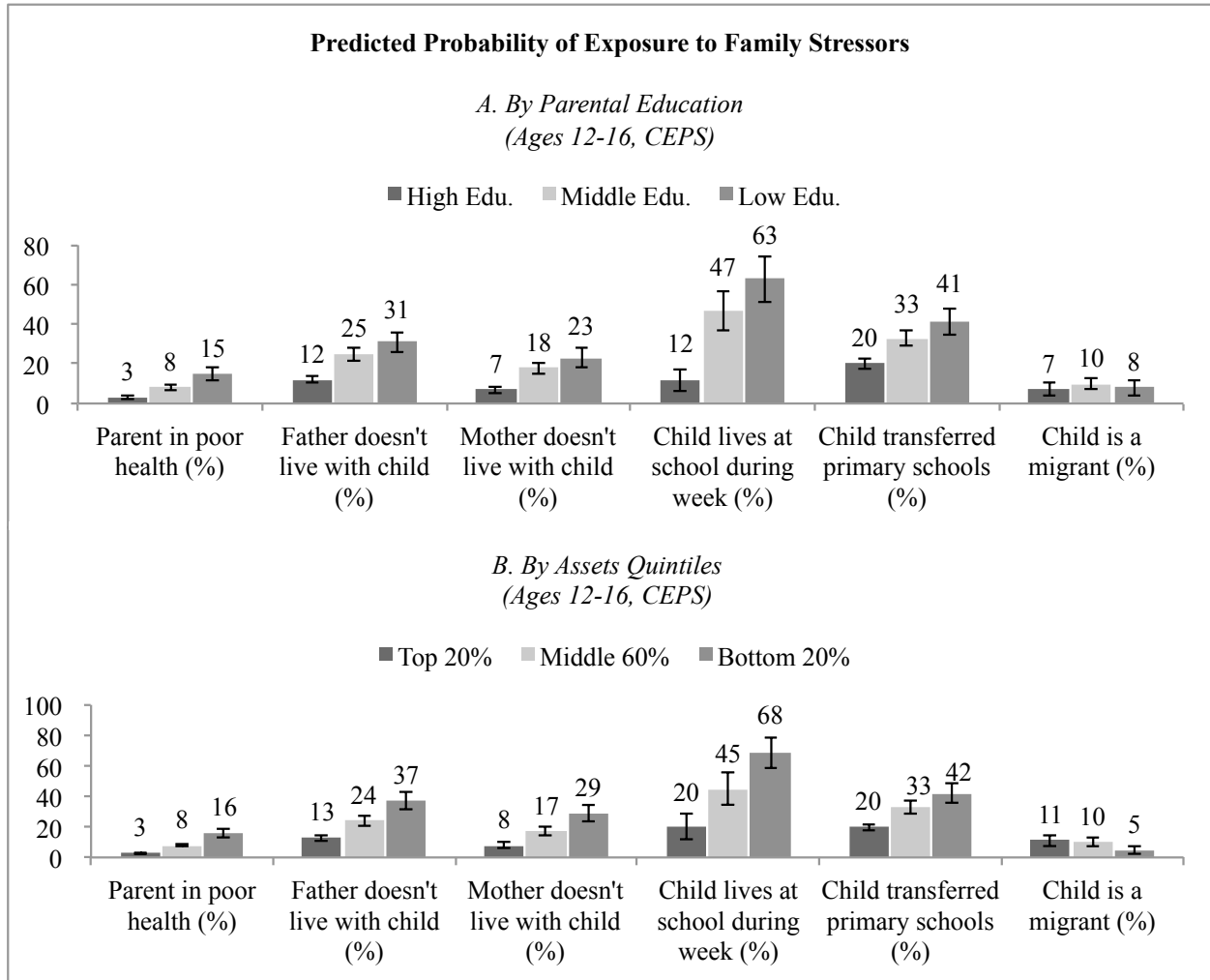
Predicted probabilities are expressed as percents and reported with 95 percent confidence intervals..

Figure 4: Parenting practices



Predicted probabilities are expressed as percents and reported with 95 percent confidence intervals.

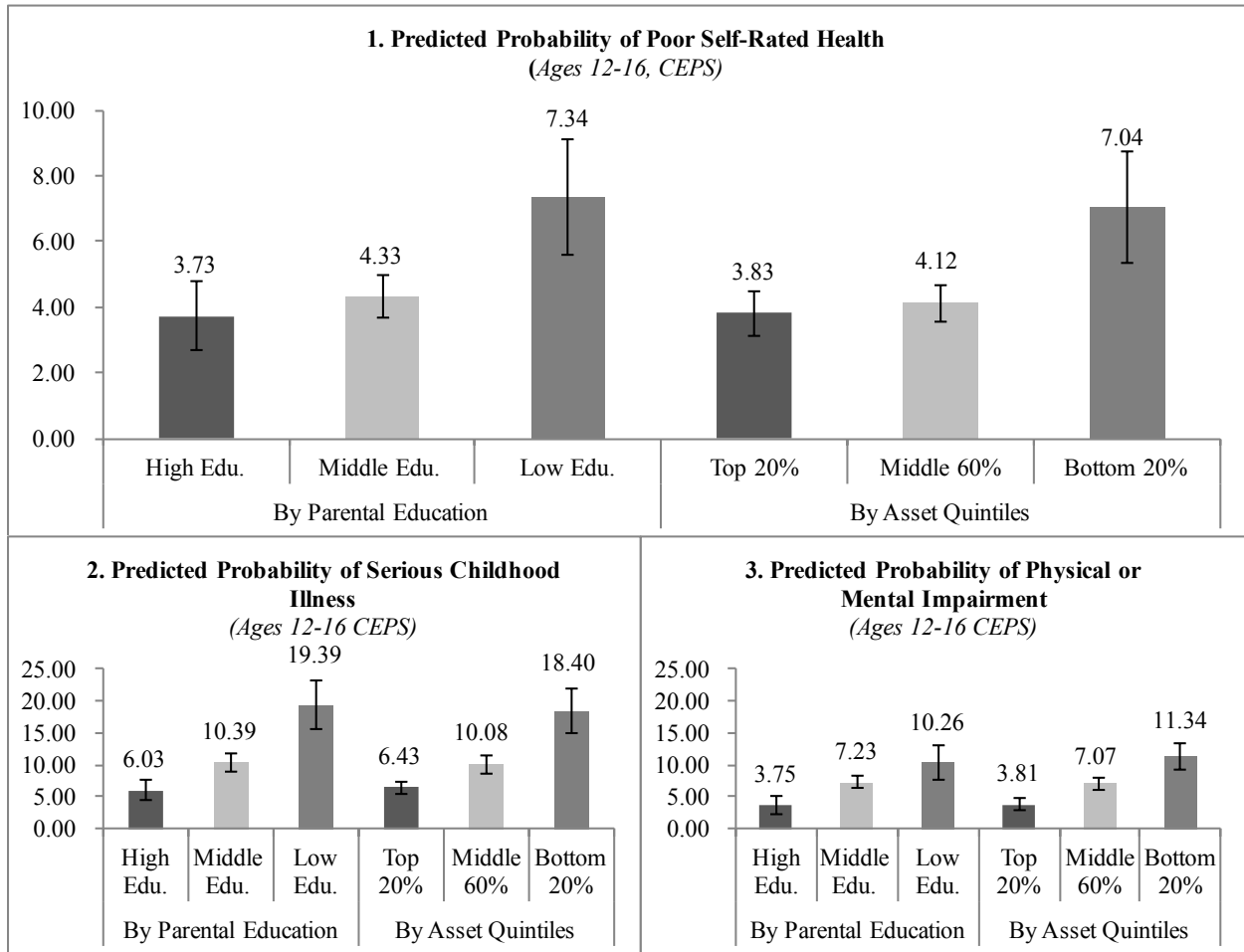
Figure 5: Family stress



Predicted probabilities are expressed as percents and reported with 95 percent confidence intervals.

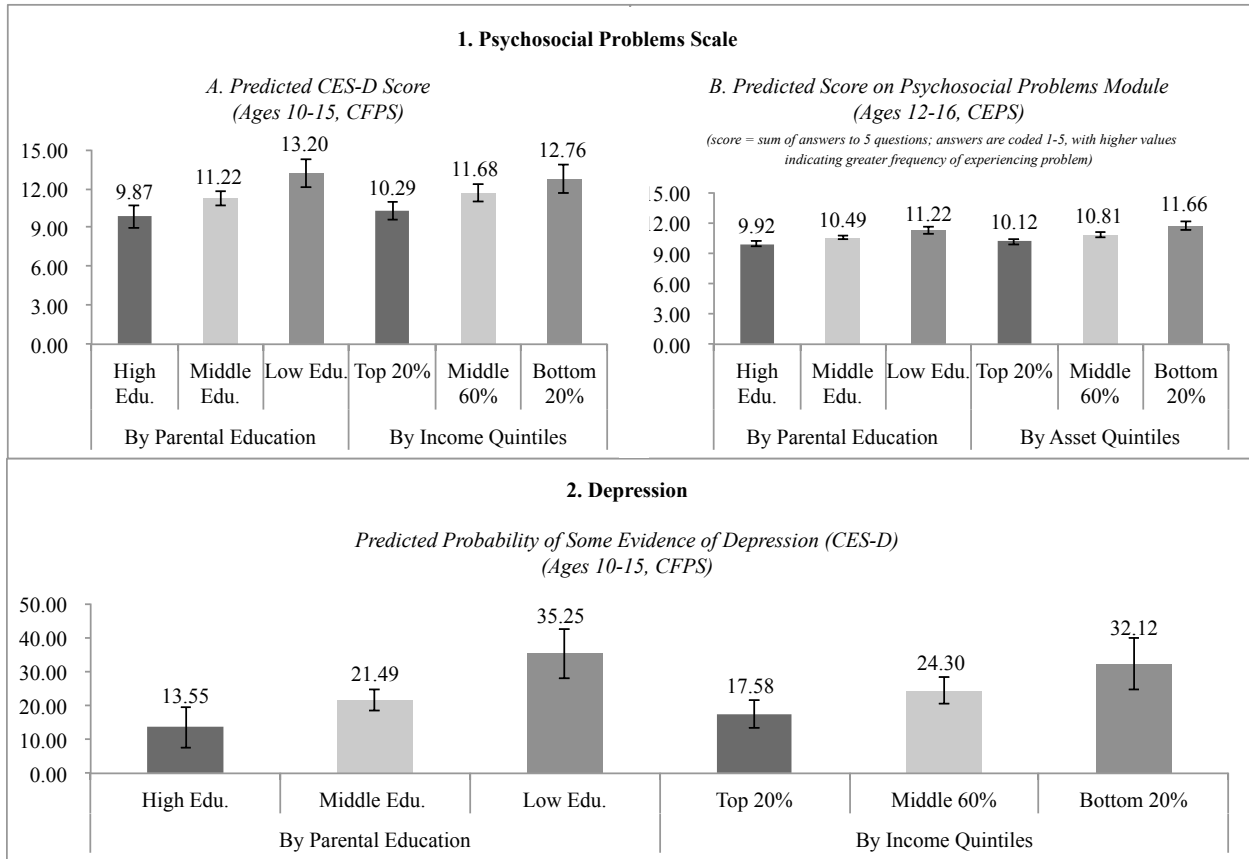


Figure 6: Welfare outcomes- physical health



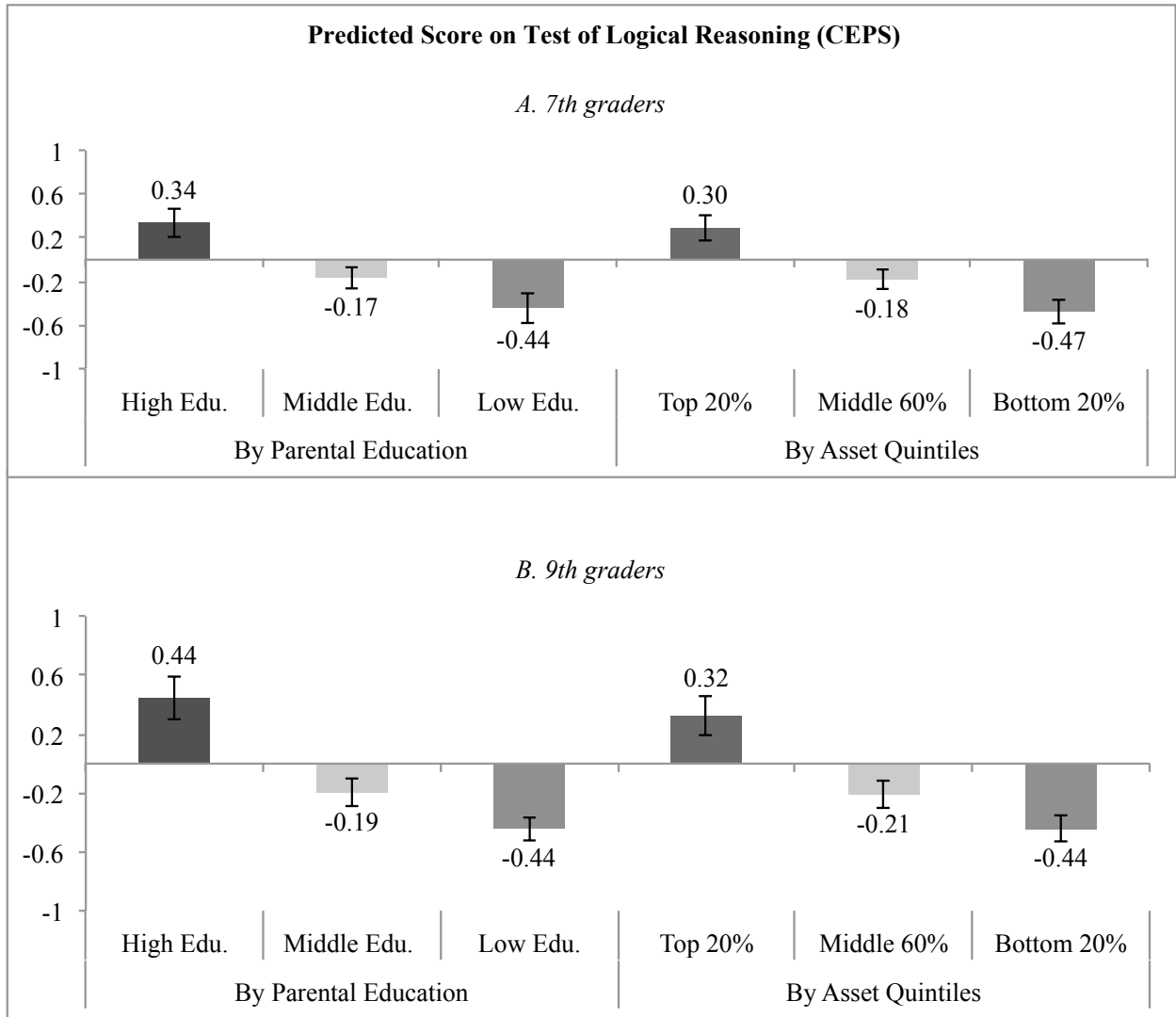
Predicted probabilities are expressed as percents and reported with 95 percent confidence intervals.

Figure 7: Welfare outcomes – psychosocial health



Reported with 95 percent confidence intervals. Predicted probabilities of depression are expressed as percents.

Figure 8: Welfare outcomes - educational performance



Reported with 95 percent confidence intervals.

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摘要：近年来，中国从一个相对平等的社会转变为一个高度不平等的社会。高度不平等对儿童的生活有何影响？本文通过分析中国家庭追踪调查和中国教育追踪调查两项全国数据，详细描述了中国儿童在改革开放后所经历的不平等的童年。研究表明，来自不同社会经济地位的儿童在家庭支出和家庭压力这两个家庭环境维度上有着显著差异。此外，在儿童福利方面，不同社会经济地位的儿童在身体健康、心理健康以及学业成绩上也有明显的区别。本研究指出，高社会经济地位的儿童与中低社会经济地位的儿童在家庭环境和儿童福利等诸多方面有着显著分化；因此，中国儿童在童年阶段的不平等，不仅来自贫困所导致的匮乏，而且源自富裕所带来的优势。

关键词：儿童福利；社会经济不平等；家庭差距；教育不平等；家庭支出；家庭压力