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Valuing Children: Parents' Perceptions, Spending Priorities and Children's Capabilities

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ABSTRACT *This paper provides a composite analysis of children's academic development grounded on the capability approach. The study utilises a panel dataset comprising 8,422 Chinese children and adolescents aged 6 to 16, observed between 2012 and 2018. It introduces a series of innovative indicators, including a parent advantage index to capture how parents influence their children and a ranking indicator for spending priorities to reify the value of children's education that families have reasoned. To address unobserved heterogeneity, we adopted fixed-effects models, multilevel modelling, and heteroskedasticity-based instrumental variables. Our primary results show that a 1% increase in the parent advantage index yields an increase of 13.85% to 21.31% in children's academic development, and the biggest leap in prioritising education-relevant spending increases the child outcomes by 2.88% to 6.57%. By highlighting the influence of parents' beings and doings, particularly the value they assign to education, this research contributes to the existing literature on child development, which often focuses predominantly on material dimensions. In sum, it expands the frontiers of the capability approach and related research on parental practices. It offers novel insights into how policies can be reinforced to equalise educational opportunities and to boost human capital.*

KEYWORDS: Capability approach; child academic development; parent advantages; prioritisation; household spending; China

JEL CLASSIFICATIONS: D10; O15; I21

1. Introduction

Debates on children's capabilities centre on the essence of human development and flourishing lives of humans. Such debates often focus on the instrumental role of education systems (Hanushek, Rivkin, & Schiman, 2016; Hanushek & Woessmann, 2008; World Bank Group, 2018), early environments (Cunha & Heckman, 2007; Heckman, 2008), parental practices (D.

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Liu, Chen, & Brown, 2020; Vasilyeva, Laski, Veraksa, Weber, & Bukhalenkova, 2018), children's health (Goldhagen et al., 2020; Gunnar et al., 2020), and children's nutrition (Black, Trude, & Lutter, 2020; Shrestha, Weissman, Thapa, Adhikari, & Perry, 2021), among others, in developing their capabilities. Regardless of how big the family is or how constituted, families are predominantly responsible for making necessary arrangements to develop their children's capabilities (Nussbaum, 2000). Particular types of distinctive good, such as a 'relationship good', only become possible because of the existence of families (Swift & Brighouse, 2014). In addition, families are important for the investments they make in their children (Becker, 1974; Becker & Tomes, 1976; Nussbaum, 2000, 2011; Sen, 1997, 2009, 2017).

Within this context, children's development depends on their capabilities that parents have 'reason to value' (Sen, 1999), that is, the valuable capabilities that parents wish to foster in their children. Despite this, parents' priorities have rarely been examined, and only indirectly estimated by children's academic studies, or simply ignored (Biggeri & Mehrotra, 2011). Consequently, these types of studies prevalently assume that parents in general attach a similar level of importance to their children's development. They ignore the fact that families' prioritisation of spending in relation to their children could reflect a concerted judgement about the value of education and their children's future, which, in turn, affects their prioritisation.

This approach applies to some recent studies examining multidimensional poverty (Zhang, Ma, & Wang, 2021) and child development in China (Chen, Deng, Zhang, Wang, & Liu, 2021; Cui, Liu, & Zhao, 2019; Sylvia et al., 2022) that focuses on the impact of parenting interventions. However, if family resources are accorded importance based on the use to which they are put, and if the use depends on how different capabilities are valued, it is essential to assess how families prioritise their resources. Given this background, the main objective of this paper is to examine how the academic performance of Chinese children and adolescents depends on household spending priorities vis-à-vis parental practices and other factors. To address these issues, several new indicators have been developed, such as the 'parent advantage index' (PAI, modelled on the Human Development Index) and the 'spending priority ranking' (SPR, based on a ranking of ten spending category groups assessed as a proportion of a family's household expenditure). Further, children's academic development is measured through an assessment of their learning outcomes and learning processes.

The nationally-representative China Family Panel Studies (CFPS) surveys provide a rich database of useful variables, such as school quality, parental reactions to children's unsatisfactory test scores, and children's study habits and discipline (SHD). The sample used for this study comprises 8,422 Chinese children and adolescents surveyed during 2012 to 2018. Our study aims to contribute to the literature on children's development by assessing the place of families in children's academic performance (Heckman & Mosso, 2014), the relevance of traditional Chinese culture that cultivates positive attitudes towards learning (Hsu & Wu, 2015), and the significance of parental prioritisation of categories of spending, as an expression of attitudes and values (Nussbaum, 2000; Sen, 1997, 2017). The study does not simply consider the impact of family resources or parental practices on their children's development, but extends to how families value education, particularly through spending prioritisation.

Overall, our results confirm the effects of parental advantages and a higher spending priority on educational and cultural activities, among others, on children's academic development. The results proved robust on a series of alternative estimations, including Lewbel (2012) heteroskedasticity-based instrumental variables.

The remainder of this paper is divided into five parts. The first part provides a framework evoked by the capability approach to evaluate children's capabilities, emphasising the role of informational pluralism and the relevance of comprehensive outcomes in evaluating children's advantages. The second part presents the data used, including descriptive statistics. The third part illustrates estimation strategies used in this paper. The fourth part discusses the results. The paper concludes by indicating how policy can enhance children's development.

2. Theoretical framework: children and the capability approach

There are many different approaches to assessing children's human development, the most-frequently used being the capability approach (Nussbaum, 2011; Sen, 2017; Yousefzadeh, Biggeri, Arciprete, & Haisma, 2019). There are two distinct versions in which this approach can be applied. In its narrower version, it focuses on the use of capability as its main informational space. In its broader version, other features of the approach are relevant (Anand et al., 2009; Comim, 2021; Comim, Qizilbash, & Alkire, 2008), such as its emphasis on informational pluralism, multidimensionality, its use of comprehensive outcomes (where the evaluation of outcomes depends also on how processes unfold), and role of individuals' agency. In this paper, we adopt the broader version of the approach given that its main contribution is not about providing new measures of capabilities but on employing the general features of the approach to produce more consistent accounts of children's human development (Burchardt & Vizard, 2011; Byskov, 2018; Chiappero, Scervini, & Salardi, 2018). Within this broader view, its first feature, pluralism, can be seen as an argument for evaluations based on informationally-rich accounts of state of affairs. It is not simply a matter of elaborating multidimensional indicators, but is also concerned with using different informational spaces to construct these indicators. The most widely-used informational spaces in the capability literature are resources, subjective well-being, rights and capabilities (Comim, 2021; Sen, 1980, 2017). Sen's argument for 'the impossibility of a Paretian liberal' was an important milestone in this debate, providing as it does a compelling formulation of rights in the literature of welfare economics (Suzumura, 2011).

The pluralist nature of the capability approach implies a valuational exercise that demands, firstly, a consideration of a multiplicity of dimensions and variables in the relevant spaces (that are more often than not heterogeneous), secondly, a solution to the complex issue of the varying importance of different functioning and capabilities and how they are evaluated, and thirdly, an engagement with the 'agency aspect' that the approach highlights. In fact, the elaboration of informationally-rich accounts is not the only important element in the capability approach, because these spaces should automatically be part of accounts that attempt to explain how autonomous actions reflect, in different degrees, a person's freedom to live in a way that they would value (Sen, 1999).

Indeed, a second key feature of the approach is how it incorporates references to autonomous actions and reasoned scrutiny as a way of capturing people's agency (Sen, 2009). This means that information should incorporate individual and collective reflective evaluations about what people have reasons to value. In theory, reasoned scrutiny represents a strong critique against assessments based on mechanical judgements, while, in practice, operationalising the scrutiny is often challenging once the exercises of prioritisation attached to the selection of key capabilities are few.

A third key feature of the capability approach, particularly in Sen's formulation, is a conceptual distinction between comprehensive outcomes (those that include the processes of choice) and culmination outcomes (those that only display the final results of the act of choice). This is because the act of choice also has process significance within which results should be characterised, not only for the final results, but also for all those features of the processes that final results involve (Sen, 2002). Thus, different results obtained from different processes cannot receive the same evaluation. Because the capability approach values individual autonomy, as discussed below, it is not sufficient to be concerned only with what an individual receives should they choose, but that they actually get to choose what they receive themselves. Thus, whenever we examine children's outcomes, we are concerned not only with the marks from their exams, but also with the learning processes involved in achieving those results.

The use of the capability approach for assessing children's capabilities invites us to look at childhood from a different perspective, integrating key aspects of:

1. the role of families in promoting human development, focusing on how children are raised,

2. the path and time-dependent dimension of practices and policies that foster children's development,
3. the recognition of children's agency and autonomy, and
4. the role of emotions during childhood.

Families are important in promoting children's capabilities, as networks of love and care (Nussbaum, 2006). It is within families that children grow up to become fully-functioning human beings and where they learn to become moral agents, particularly in early childhood. Parental practices can often be categorised as distinct parenting styles that portray certain behavioural and attitudinal patterns towards children. The most influential styles are:

- authoritative: evident when parents show understanding, open communication, respect and emotional support and considered the most effective and loving parenting style,
- authoritarian: evident when parents rigorously assess their children's behaviour, impose rigid norms and punishment without sympathy for children's difficulties, typically exemplified by an absence of emotional support,
- permissive: evident when parents acquiesce in actions and behaviours as their children please, still probably being loving and sympathetic yet not responding with discipline and control. This is often the case with absent parents who try to compensate for their absence by indulging their children, and
- negligent: evident when parents do not show much interest in their children's development. Their involvement is minimum, with parents spending little time with their children and offering little or no level of support and control.

Different parenting styles entail different prioritisation strategies that parents use to manage their children's human development. A variety of circumstances can embody the prioritisation, namely, by the amount parents spend on their children's education, the time they dedicate to play with their children, whether they help with homework or not, and whether parents support their children emotionally. While parenting styles might not be empirically evident in the clear-cut descriptions above, this categorisation is useful in calling attention to the diversity of processes of raising children.

A common mistake in assessing children's development is viewing childhood as a single discrete period in one's life, without considering different stages of child development as being unevenly affected by biological and neurological factors (Borghans, Meijers, & ter Weel, 2008; Cunha & Heckman, 2007). Indeed, children's receptiveness to language learning is higher by 3 years of age, their IQ scores are often stable by the age of 10, and emotions and self-regulation from the malleability of the pre-frontal cortex lasts until the end of adolescence (Rose & Fischer, 2011; Heckman, 2008). Correspondingly, investment in early childhood education should be distinguished from that in late childhood, and the impact of parental investment on children's skills and human development also depend on sensitive (more effective) and critical (unique) periods. Time is of the essence in the matter of being a child, given how their development is uniquely sensitive to different flows of time and timing of particular interventions. Time also matters from another angle – children need time with their parents, time for playing, time for being creative, and time in which they are protected and can flourish.

The use of the capability approach also encourages consideration of how children develop their own capabilities. As much as children require some basic functionings, such as compulsory education, before they can fully exercise their autonomy (Nussbaum, 2011), it is important to acknowledge that children have a certain capacity for self-determination that is exercised from a very early age (Ballet, Biggeri, & Comim, 2011; Saito, 2003). Children will have fully-fledged autonomy when they become adults, with conceptions of what is right and what is good developed with faculties enabled during childhood (Rawls, 1971). Whereas a paternalistic view sees

children as vulnerable and dependent on their parents, a capability view sees children as an evolving project of human self-determination. The debate is not that children are unable to make choices, but that they may not be able to evaluate and revise the choices they make. Evidence suggests that children start to learn to be independent of their parents from an early age (Lansdown, 2004). No one claims that children can display the same level of self-determination as do adults. The flaw is in denying to children a capacity for self-determination that is progressively evolving. In fact, children can persuade adults of what they want, and they can negotiate and renegotiate boundaries imposed by adults (Alderson, 2001; Anich, Biggeri, Libanora, & Mariani, 2011; Punch, 2002). This means that a child's human development should not be seen merely as a result of his or her parents' priorities, but rather as an interactive process between parents and the expression of the child's own agency (Bellanca, Biggeri, & Marchetta, 2011).

Finally, we refer to the role of emotions in shaping children's ethical reasoning (Nussbaum, 2006, 2011). While emotions help to explain children's motivation for acting and their endurance (Biggeri, Ballet, & Comim, 2011a), they also have an important cognitive role. As Nussbaum (2011) and Cunha and Heckman (2007) demonstrate, emotions can be decisive for the formation of children's deliberative beliefs, enabling them to perceive critical features in a situation. An example is useful here. A father singing nursery songs to his baby daughter fosters the baby's moral life and, as such, can be understood as a key practice to be respected and supported in the promotion of the child's future capabilities. The human sense of value is built upon such interactions within which emotional cognition plays an important role.

Assessing children's human development through a capability lens means that we should look at it from a multidimensional and pluralist perspective, analysing how families define their priorities about what they have reason to value related to their children's development. Further, it means going beyond the concept of children as beings without emotions or will. Understanding the formation of children's capabilities, therefore, entails seeing them as quintessentially dynamic and time-dependent. Of course, it is difficult to emphasise all these different elements in a single analytical discussion. For this reason, we highlight here the links between parental practices and spending priorities, and the impact they might have on children's cognitive development.

3. Data description and variable definitions

3.1. Data source

We based our empirical analysis of children's capabilities on the China Family Panel Studies (CFPS), a nationally-representative survey launched in 2010 by the Institute of Social Science Survey, Peking University. The CFPS is modelled on the Panel Study of Income Dynamics of the U.S. to collect data biennially at the individual, household, and community level from 25 provinces, municipalities, and autonomous regions, representing 95% of China's population. Information on children and adolescents within surveyed households was separately collected.[1] The attrition rate is around 25% biennially. In this study, 4 out of 5 waves were merged to assemble a panel covering data from 2012 to 2018, with child-, adult- and household-level data matched year-to-year. The 2010 survey data was not included because variables provided in the later waves were absent in this initial version. Therefore, our panel includes 8,422 children and adolescents aged 6 to 16 who attended school.

3.2. Child academic development index

Children's capabilities comprise a rich array of cognitive and socio-emotional dimensions. If we were to follow Nussbaum's (2018) list of central capabilities, to construct a comprehensive index, we would need indicators of children's senses, imagination and thought, emotions, practical

reasoning, and sense of affiliation or even of play, including the ability to laugh. Unfortunately, data for this kind of evaluation are not normally found empirically. For this reason, we adopted a modest approach, concentrating on a core aspect of children's human development, namely, their academic development. However, our indicator goes beyond just test scores in literacy and numeracy to include children's study habits and other non-cognitive elements.

It is important to note that, in the Chinese education system, test scores are decisive information for children to move forward in the education system and the main mechanism for entry into prestigious schools. Consequently, the Gaokao (the national college entrance examination in China) is deemed a major turning point in the life course that determines a person's career opportunities, earning potential, and even marriage prospects. Studying for the three-day Gaokao can be likened to a marathon in which a variety of cognitive, non-cognitive, and environmental factors connect to shape the outcome. Following Amartya Sen's distinction between culmination and comprehensive outcomes (Sen, 2002), we focus on children's academic development by structuring it into two parts: one examining learning outcomes (corresponding to culmination outcomes) and the other taking into account learning processes (to reflect comprehensive outcomes).[2]

The CFPS provides two ordinal variables scored by parents, describing children's academic achievement in Mathematics and Chinese based on their performance in the previous semester. We calculated the average point of the two subjects and normalised the result. Likewise, learning processes were measured as the normalised average of seven questions evaluated by parents regarding how good their child's study habits and discipline (SHD) were.[3] Questions are summarised in Appendix Table B1. The children's academic development index was formulated as follows:[4]

$$\begin{aligned} Score &= \frac{Mathematics + Chinese}{2} \\ SHD &= \frac{QA1 + QA2 + \ldots + QA7}{7} \\ Norm_Score &= \frac{Score - Min(Score)}{Max(Score) - Min(Score)} \\ Norm_SHD &= \frac{SHD - Min(SHD)}{Max(SHD) - Min(SHD)} \end{aligned} \tag{1}$$

$$CADI = \frac{Norm_Score + Norm_SHD}{2} \tag{2}$$

It is important to note that parents' understanding of their children's capabilities might be more relevant than the capabilities *per se* in this case, given that test scores are always limited in what they test, while parents can have a more comprehensive knowledge of their children's skills informed by sequences of tests and other indicators that naturally enter into the formation of their views. They are also key observers of their children's study habits that incorporate a wide range of non-cognitive elements. Moreover, both methods and difficulties of tests varying substantially across schools and regions could also introduce considerable noises to using objective scores as the evaluative information of student achievements.

3.3. *Parent advantage index*

Socio-cultural factors, particularly family-related, influence the formation and development of children's mindsets and behaviours. Thus, we created three variables to account for parents' beings and doings. Among them, the parent advantage index is a unique proxy for functionings. As aforementioned, the PAI is based on the Human Development Index using proxies for the HDI dimensions, such as self-evaluated health status, years of schooling and the natural logarithm of household net income per capita.[5] We adopted household net income per capita to

account for intergenerational financial transfers, which commonly occur in Chinese families, that may be driven by the traditional culture of filial piety (see e.g. Sun, 2004; H. Zhu, 2016).[6] Furthermore, previous studies pointed out that material (housing or financial) support and living arrangements were often intertwined (see e.g. Li & Wu, 2019; Yi, Deng, Fan, & Ong, 2018; Yin, 2010). In this sense, the benefits or burdens placed on adults by their elderly parents need to be considered when assessing their economic advantages.[7]

The PAI follows the pluralist approach advocated by Sen and Nussbaum once it combines a subjective variable (self-evaluated health status) with a variable of functionings (years of schooling) and another grounded in resources (household income). It does not differ significantly from the traditional HDI in conception and, as such, cannot be interpreted as an index of capabilities, although it follows a key characteristic of the capability approach. The combination of subjective and objective variables is justified by Sen (2008) and Sen (2009). The problem, as he explains, is not the use of subjective information per se in valuational exercises, but the generalisation of subjective information to analyse all aspects of a problem. This combined use of subjective and objective information can also be found in Burchardt & Vizard, (2011) and Comim et al. (2008).

3.4. *Spending priority ranking*

Several methods are used in the capability literature to select relevant capability information (Burchardt & Vizard, 2011; Byskov, 2018). However, these methods often focus on how researchers can identify basic or key capabilities from statistical data without directly tackling the reasoned scrutiny aspect of capabilities, where individuals' priorities are represented by particular indicators. As much as this is not a trivial task, being able to signal how individuals translate their 'reasons to value' into specific priorities is essential under this framework. For this reason, we have built an indicator that attempts to represent individuals' priorities through their budget allocation choices. We classified 26 expenditure items into ten groups, according to Xie et al. (2017), and calculated spending on items within each group. By calculating the ratio of spending in each group to total expenditure, we then ranked the groups, associating higher percentages of spending with higher levels of priority.[8] In other words, the number '10' represents the highest priority here. Previously, Ratigan (2017) compared social policy priorities of Chinese provinces in a fashion similar to ours.

As shown in Figure 1, nearly 47% of households gave the highest priority to the 'diet-relevant' spending group, while the largest share of spending on the transport-relevant group was 21%, ranked eighth. Similarly, for the group of 'rent and utilities', a sixth-level priority given by around 17% of households was the most common, and the prevailing rank seen in the 'necessity-relevant' group was ranked fifth. Further, medication, healthcare, and sports items were prioritised fourth by approximately 20% of the families. In contrast, the 'education-relevant' group was more significant, ranked ninth and tenth by 30% of the families in total. This is the key variable of interest in our analysis since it reflects how households value investing in their children. In addition, spending on clothing-relevant items was most often ranked sixth and fifth. The remainder of the spending groups had similar distributions, with the donation-, insurance- and all-other-relevant consumption ranked third by 46%, 42%, and 40% of the households, respectively. All these variables are further summarised in Appendix Table B2.

We also created a group of supplementary SPR indicators in the same way by adding housing mortgage to the utility-relevant group and re-ranked spending groups accordingly. Corresponding statistics are reported in Supplementary Materials Table SA1. However, only 73% observations are retained because the CFPS didn't survey households' housing mortgage in 2012. All other covariates are discussed in Appendix A.

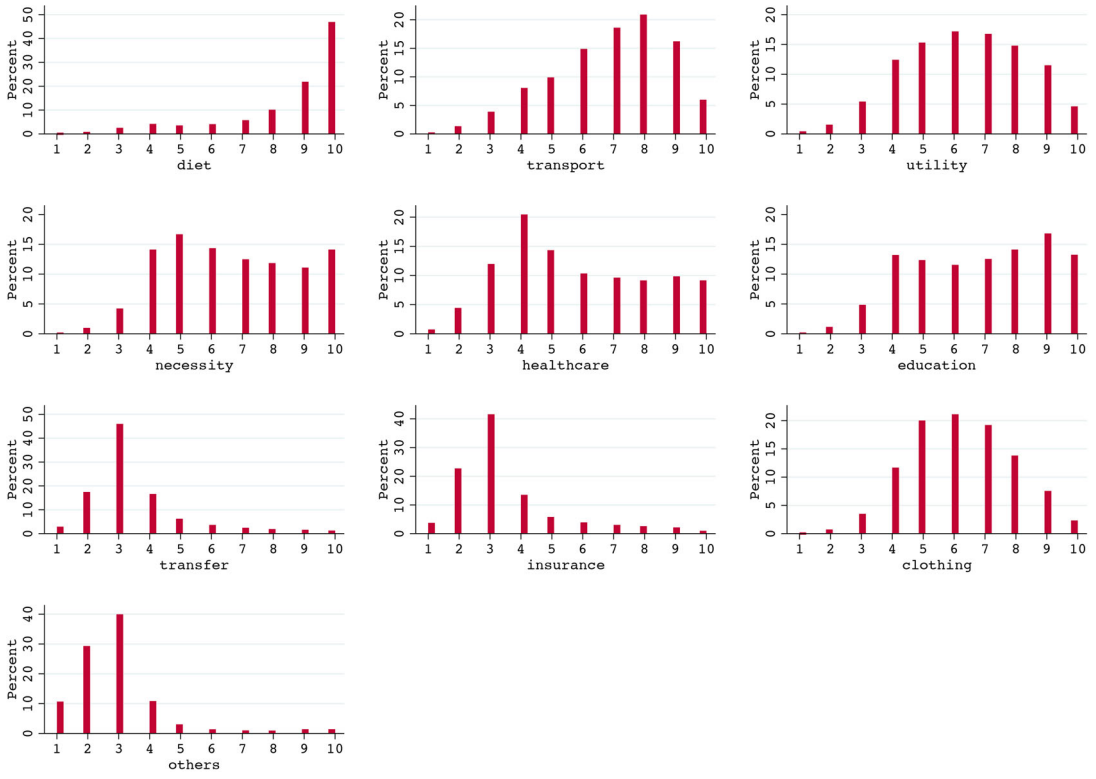

Figure 1. Histograms of the SPR indicators
Note: By design, larger numbers here reflect higher priorities.
Source: Authors' elaboration using CFPS data.

4. Econometric modelling and techniques

We undertook a threefold empirical analysis. To alleviate potential endogeneity, we firstly adopted a fixed-effects model. Since some informative variables are time-invariant and our core predictors are slowly-varying household-level variables,[9] a within individual or household estimator is not applicable. Yet all individuals were nested within their households, we thus checked the robustness of the results by considering multilevel modelling, which helped eliminate household-level unobserved heterogeneity. Given that our data contain 6,405 households and 8,422 children, variations estimated in this way were within-child for the majority of the observations, acting as an ideal alternative to individual fixed effects. Finally, we double-checked our analysis with Lewbel (2012) heteroskedasticity-based instruments. This approach is widely used when external instruments are not available (e.g. Chung, Zhang, & Partridge, 2020; Z. Liu & Yu, 2020). Due to space limitations, further discussion on the hierarchical linear and 2SLS models is provided in Supplementary Material C.

4.1. Fixed effects models

The main specification is as follows:[10]

$$CADI_{it} = \alpha + \beta_1 PAI_{it} + \beta_2 SPR_{it} + \beta_3 X_{it} + \gamma_j + \gamma_B + \gamma_N + \gamma_t + \varepsilon_{it} \tag{3}$$

where $CADI_{it}$ is the child academic development index of a child i living in province j identified in wave t. PAI_{it} is the average parent advantage index of child i's parents; SPR_{it} are spending priorities of child i's household;[11] X_{it} is a row vector of individual and household

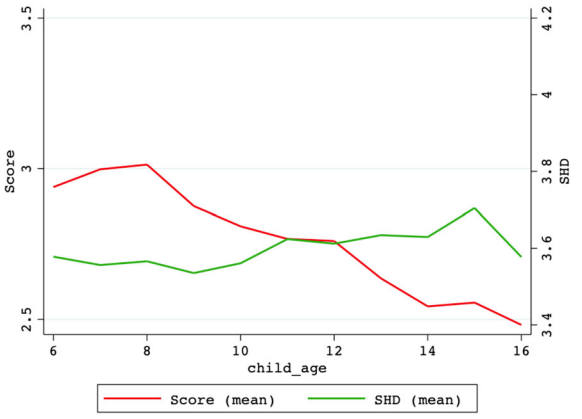

Figure 2. Test scores and study habits and discipline against child age
Source: Authors' calculation using CFPS data.

characteristics. γ_j are province fixed effects; γ_B are child i's birth year fixed effects; γ_N are the number of children fixed effects; γ_t are the survey wave fixed effects. ε_{it} is an idiosyncratic error term.

The survey wave fixed-effects allow us to avoid systematic differences imposed by time across the four waves used in this study. The province fixed-effects help eliminate unobserved macro factors existing at the provincial level, such as differences in educational standards and Gaokao policies. Further, the birth year fixed-effects reduce two concerns. Firstly, new education-relevant policies could be issued every few years, altering parents' attitudes and children's learning experiences. Secondly, as shown in Figure 2, one component of the CADI, test scores, tends to decrease for children who become older. Additionally, as China had widely implemented the One-Child Policy for over two decades until late 2015, some invisible but ingrained differences in the families, such as a strong son preference, a lack of contraception or abortion, and religious factors, would be expected between one-child and multiple-child families. Even within multiple-child families, the number of children would most likely have an essential impact on household spending behaviours and the value placed on each expenditure item.

Beyond the priority ranking, it is of interest to know if conversion factors in our model form differential effects on child outcomes. For instance, for children who attended a key school, it is likely that educational resources were converted into learning outcomes more efficiently than for their ordinary-school counterparts, *ceteris paribus*. Following Comim, Fennell, and Anand (2018),[12] we estimate conversion rates by including interaction effects between four dummies and the SPR indicators.[13]

Therefore, we added the interaction terms, one by one, to the model, as follows:

$$CADI_{it} = \alpha + \beta_1 PAI_{it} + \beta_2 SPR_{it} + \beta_3 X_{it} + \beta_4 (SPR_{it} * D_{it}) + \beta_5 D_{it} + \gamma_j + \gamma_B + \gamma_N + \gamma_t + \varepsilon_{it} \quad (4)$$

where D_{it} is the dummy variable accounting for the conversion factor of interest. Other variables remain the same, as above.

5. Empirical analysis

5.1. Main results

In Table 1 below, we report the results of five models: a baseline model where no covariates but the PAI and SPR indicators are estimated; a FE model where all covariates and fixed-effects are included; a FE model using supplementary SPR indicators; a lagged FE model where SPR_{it} are replaced by SPR_{it-2}; two sub-group FE models, where observations are divided into one-

child and multi-child families.[14] Here, the PAI is statistically significant at the 1% level across all models, showing that a 1% change yields an increase in the CADI of 13.85% for multi-child families, 20.61% for one-child families, and 17.64%–21.31% in general. Likewise, the key SPR indicator is consistently significant, demonstrating that a change in prioritising education-relevant items from the lowest to the highest rank enhances children's academic development by 3.42% for one-child families, 6.57% for multi-child families, and 2.88%–5.13% in general.[15] Further, another three SPR indicators are found influential in general, that is, the healthcare-, donation- and clothing-relevant spending priority, despite being negligible in Column (3) or (5).[16] In Supplementary Material C, we present the robustness check of the results using other estimators.

With regard to control variables, several findings are noteworthy. At the child level, girls' academic development is approximately 4.5%–5.3% better than boys', and, compared to students at ordinary schools, attending key schools is accompanied by an increase of 1.96%–2.85% in the CADI. At the parent or household level, having savings for educational purposes is found to prompt child outcomes by 1.83% for one-child families, 3.34% for multi-child families, and 2.32%–2.48% in general; children whose parents are divorced or widowed have a 2.78%–4.46% lower CADI than their counterparts; a 1% increase in parental practices yields 8.31%–11.4% higher CADI in general, while the impact for multi-child families is 184% higher than for one-child families; compared to negative reactions, a positive reaction to children's unsatisfactory test scores increases the CADI by 5.59% in multi-child families, 8.51% in one-child families, and 6.44%–6.79% in general. Additionally, parents' average age and children's health status are found to be influential in three other models but not in the multi-child model. In sum, having younger parents and worse health status are associated with the lower CADI.

We examined conversion rates, (Columns (1)–(4) of Table 2), using four conversion factors in order: (a) children's gender, (b) if either parent received higher education, (c) if households lived in urban areas, and (d) if children attended a key school. Moreover, in Column (5), we replace the PAI with differences in the PAI, i.e. $PAI_{it} - PAI_{it-2}$,[17] to examine if parents' self-advancement over time influences their children. As seen in the table, two conversion factors, i.e. tertiary education and key school, are found to differentiate effects for four spending priorities.[18] Urban residence also plays a role in three aspects, while being born a boy rates as just better at converting insurance-relevant resources into the CADI. More specifically, categories of children who have one highly-educated parent at least, convert utility-, necessity-, education- and transfer-relevant goods and services more efficiently into their development. Noteworthy is that a difference in the CADI can be as large as 21.96% arising from prioritising education-relevant items from the lowest to the highest rank when a highly-educated parent is involved. Similarly, attending a key school further helps children to convert transport-, necessity-, healthcare-, education- and transfer-relevant resources into their academic performance. In contrast, compared to their rural counterparts, children living in urban areas convert healthcare-, education- and transfer-relevant resources relatively inefficiently. Lastly and importantly, as shown in Column (5), a 1% increase in the PAI growth raises the CADI by 7.11%. This finding reveals that what parents achieve for themselves is also influential to their children's development, at least academically.

5.2. How does family income influence prioritisation?

While poor families may have to prioritise spending on food, utilities, and daily necessities over education, wealthy families have a wider range of options that may diversify their spending. In light of this, we further explore how household net income per capita influences their spending priorities on items related to education. In the first part of Supplementary Materials Table SA4, we present the corresponding results. Column (1) is the simplest specification where only income and SPR variables are included. To account for the non-linearity of income effects

Table 1. Spending priorities, parent advantages and child academic development

	(1) Baseline	(2) Main SPR	(3) New SPR	(4) Main Lag	(5) One-Child	(6) Multi-Child
PAI	0.2131***	0.1764***	0.2014***	0.1966***	0.2061***	0.1385***
	(0.0201)	(0.0249)	(0.0278)	(0.0336)	(0.0324)	(0.0378)
diet	0.0013	0.0024	0.0043	0.0021	−0.0001	0.0047**
	(0.0014)	(0.0015)	(0.0029)	(0.0021)	(0.0023)	(0.0022)
transport	0.0009	0.0024*	0.0042*	0.0018	0.0014	0.0036*
	(0.0012)	(0.0014)	(0.0021)	(0.0018)	(0.0020)	(0.0021)
utility	−0.0004	0.0006	0.0016	0.0025	0.0019	−0.0002
	(0.0011)	(0.0013)	(0.0019)	(0.0016)	(0.0019)	(0.0018)
necessities	−0.0024**	0.0003	0.0002	0.0019	0.0010	−0.0005
	(0.0011)	(0.0013)	(0.0019)	(0.0017)	(0.0019)	(0.0017)
healthcare	0.0007	0.0028**	0.0030*	0.0031*	0.0017	0.0041***
	(0.0010)	(0.0012)	(0.0018)	(0.0018)	(0.0019)	(0.0015)
education	0.0032***	0.0057***	0.0053***	0.0049**	0.0038*	0.0073***
	(0.0011)	(0.0012)	(0.0019)	(0.0019)	(0.0020)	(0.0017)
donation	0.0033**	0.0029*	0.0035	0.0034*	0.0008	0.0046**
	(0.0013)	(0.0015)	(0.0022)	(0.0020)	(0.0023)	(0.0020)
insurance	−0.0012	−0.0014	−0.0012	0.0029	−0.0003	−0.0031
	(0.0013)	(0.0014)	(0.0021)	(0.0020)	(0.0021)	(0.0021)
clothing	0.0015	0.0036**	0.0018	0.0055***	0.0027	0.0044**
	(0.0014)	(0.0015)	(0.0023)	(0.0021)	(0.0023)	(0.0019)
other	−0.0023*	0.0003	(omitted)	−0.0003	0.0005	0.0000
	(0.0012)	(0.0013)		(0.0020)	(0.0020)	(0.0018)
parent_age		0.0018***	0.0020***	0.0020***	0.0028***	0.0011
		(0.0006)	(0.0007)	(0.0007)	(0.0007)	(0.0008)
child gender		−0.0466***	−0.0495***	−0.0531***	−0.0463***	−0.0445***
		(0.0050)	(0.0058)	(0.0069)	(0.0063)	(0.0072)
sleep		0.0024	0.0026	0.0026	−0.0004	0.0026
		(0.0026)	(0.0031)	(0.0034)	(0.0036)	(0.0035)
child health		−0.0030***	−0.0032***	−0.0034***	−0.0062***	−0.0013
		(0.0010)	(0.0011)	(0.0013)	(0.0013)	(0.0014)
edu_savings		0.0242***	0.0232***	0.0248***	0.0183***	0.0334***
		(0.0050)	(0.0061)	(0.0069)	(0.0068)	(0.0079)
marital		−0.0313**	−0.0416***	−0.0446***	−0.0278*	−0.0363**
		(0.0121)	(0.0144)	(0.0166)	(0.0150)	(0.0179)
parental practices		0.1140***	0.0966***	0.0831***	0.0564***	0.1601***
		(0.0147)	(0.0178)	(0.0199)	(0.0211)	(0.0213)
residence		0.0026	−0.0009	0.0002	0.0147*	−0.0080
		(0.0055)	(0.0070)	(0.0076)	(0.0078)	(0.0071)
absence		0.0277**	0.0201	0.0100	0.0199	0.0274*
		(0.0125)	(0.0132)	(0.0157)	(0.0190)	(0.0156)
key_school		0.0285***	0.0224***	0.0196***	0.0283***	0.0272***
		(0.0049)	(0.0061)	(0.0066)	(0.0066)	(0.0072)
reaction (passive)		0.0398**	0.0303	0.0377	0.0679***	0.0234
		(0.0175)	(0.0208)	(0.0234)	(0.0227)	(0.0267)
reaction (positive)		0.0679***	0.0663***	0.0644***	0.0851***	0.0559***
		(0.0069)	(0.0089)	(0.0100)	(0.0114)	(0.0092)
Constant	0.6266***	0.4138***	0.4279***	0.4352***	0.4258***	0.4175***
	(0.0028)	(0.0368)	(0.0446)	(0.0489)	(0.0474)	(0.0482)
Time FE	N	Y	Y	Y	Y	Y
Province FE	N	Y	Y	Y	Y	Y
Birth FE	N	Y	Y	Y	Y	Y
Num. of child. FE	N	Y	Y	Y	N	Y
Obs	10299	7811	5190	4015	3685	4125
R squared	0.0191	0.1085	0.1078	0.1091	0.1466	0.1020

Notes: The PAI and SPR variables are centred. In Column (4), all SPR variables are lagged by two periods because the CFPS was conducted biennially. Robust standard errors shown in parentheses are clustered at the province-birth cohort level. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.
Source: Created by authors using CFPS data.

widely discussed in previous literature (Cooper & Stewart, 2013), we then added a quadratic term since Column (2). More control variables are included in Column (3), and Column (4) utilises the supplementary SPR indicators. As seen, the results are fairly consistent, pointing out a negative relationship between household income and spending priorities on education, while additional household income can mitigate the negative effects, and the relationship eventually reverses among the richest 1%.

This is probably because richest families are more likely to spare no expense for marginal increases in their children's education quality, while the value for money may still be a concern for better-off families, considering their spending can already grant their children access to sufficient educational resources and services. In contrast, with a commonly held belief that 'education changes destiny' (e.g. Chen & Wang, 2021; Zhu & Yu, 2022), poor families in China often view education as the primary means to escape poverty and enhance social mobility, leading them to prioritise spending on their children's education. In Supplementary Materials Figure SB1, we aggregated the SPR indicator and visualised its distributions for different decile groups. Despite random variations in distributions between different groups, the top 10% of households show a clear pattern with more families prioritising education-relevant spending at a higher level. In comparison, the distribution of spending priorities in the bottom 10% of households is much more scattered, with similar percentages between groups, except for the two groups with the lowest priority.

The second part of Supplementary Materials Table SA4 examines whether children from better-off families present better academic development. Results based on the computed quartile are in Columns (5)–(6) and on the official quartile are in Columns (7)–(8). Here, to provide a more detailed picture, we utilise the components of the CADI, i.e. test score and SHD, as the DVs. Surprisingly, children from the top 25% of households tend to exhibit, on average, the highest test scores, they however have the worst behavioural development. Possible reasons here include stronger emphasis poorer families put on children's agency and autonomy and children's self-development of helpful learning behaviours driven by limited access to educational resources and opportunities. This can be linked to previous findings that family investments could exert a greater influence on children's cognitive development, while parenting style may have a stronger impact on their behavioural outcomes (Cooper & Stewart, 2013).

Furthermore, we performed subgroup regressions using both aforementioned quartile variables and report the results in Supplementary Materials Table SA5. The results show that the top 25% of families have the strongest effects on improving children's academic development by prioritising spending on education-relevant items. In comparison, no effect is found for the bottom 25%. A plausible reason here is the deprivation of access to good education quality so that increasing expenditure on educational activities is sadly a waste for those families. To gain deeper insights into this finding, we introduced an interaction term between 'key school' and the SPR indicator in this subgroup and present the results in Supplementary Materials Table SA6. We only report the results where the DV is the test score because no effect is found for SHD. A visual illustration based on the results in Column (2) can be found in Supplementary Materials Figure SB2. The results demonstrate that, as opposed to ordinary school children, children who attend a key school do benefit from a higher spending priority on education, with a potential difference as large as 12.96% to 21.06%.

5.3. How do gendered breadwinners influence prioritisation?

Mothers tend to allocate income more towards children compared to fathers (Cooper & Stewart, 2013). Akee, Copeland, Keeler, Angold, and Costello (2010) demonstrate that the extra income improved children's educational outcomes only if mothers were the recipients. Building on this premise, we differentiate between families where mothers earn equal or higher incomes, and those where fathers are the primary earners. This, on one hand, allows us to

Table 2. Estimates of conversion factors with interaction effects

	(1) Gender	(2) Tertiary	(3) Residence	(4) Key School	(5) PAI Growth
PAI	0.1745***	0.1721***	0.1781***	0.1775***	
	(0.0248)	(0.0250)	(0.0248)	(0.0252)	
PAI_growth					0.0711**
					(0.0315)
child gender	−0.0461***	−0.0464***	−0.0466***	−0.0465***	−0.0507***
	(0.0051)	(0.0050)	(0.0050)	(0.0050)	(0.0083)
parent_highedu		0.0185			
		(0.0138)			
residence	0.0028	0.0019	0.0011	0.0030	0.0099
	(0.0055)	(0.0055)	(0.0055)	(0.0055)	(0.0082)
key_school	0.0286***	0.0277***	0.0282***	0.0297***	0.0141*
	(0.0049)	(0.0049)	(0.0049)	(0.0048)	(0.0074)
diet	0.0031	0.0021	0.0040**	0.0015	0.0024
	(0.0022)	(0.0015)	(0.0019)	(0.0018)	(0.0045)
transport	0.0014	0.0023	0.0040**	−0.0000	0.0035
	(0.0019)	(0.0014)	(0.0018)	(0.0017)	(0.0032)
utility	−0.0002	0.0004	0.0014	−0.0003	0.0003
	(0.0017)	(0.0013)	(0.0018)	(0.0015)	(0.0030)
necessities	−0.0001	−0.0002	0.0015	−0.0012	0.0017
	(0.0016)	(0.0013)	(0.0017)	(0.0015)	(0.0028)
healthcare	0.0023	0.0030**	0.0052***	0.0013	0.0040
	(0.0016)	(0.0012)	(0.0015)	(0.0013)	(0.0028)
education	0.0049***	0.0051***	0.0082***	0.0044***	0.0054*
	(0.0019)	(0.0012)	(0.0016)	(0.0015)	(0.0032)
donation	0.0008	0.0024	0.0049**	0.0007	0.0035
	(0.0022)	(0.0015)	(0.0019)	(0.0016)	(0.0028)
insurance	−0.0054***	−0.0016	−0.0006	−0.0017	0.0003
	(0.0020)	(0.0015)	(0.0019)	(0.0017)	(0.0029)
clothing	0.0022	0.0036**	0.0037*	0.0035**	0.0041
	(0.0020)	(0.0015)	(0.0019)	(0.0016)	(0.0033)
others	0.0019	0.0004	0.0015	−0.0011	0.0003
	(0.0018)	(0.0013)	(0.0018)	(0.0016)	(0.0037)
diet × Dummy	−0.0009	0.0141	−0.0041	0.0032	
	(0.0032)	(0.0096)	(0.0032)	(0.0033)	
transport × Dummy	0.0023	0.0109	−0.0042	0.0095***	
	(0.0026)	(0.0078)	(0.0028)	(0.0027)	
utility × Dummy	0.0016	0.0163*	−0.0020	0.0029	
	(0.0025)	(0.0083)	(0.0027)	(0.0028)	
necessities × Dummy	0.0012	0.0198***	−0.0031	0.0054**	
	(0.0025)	(0.0075)	(0.0027)	(0.0024)	
healthcare × Dummy	0.0014	0.0057	−0.0062**	0.0061**	
	(0.0025)	(0.0075)	(0.0025)	(0.0024)	
education × Dummy	0.0018	0.0244**	−0.0067**	0.0053*	
	(0.0027)	(0.0096)	(0.0027)	(0.0030)	
donation × Dummy	0.0041	0.0217**	−0.0053*	0.0081***	
	(0.0029)	(0.0096)	(0.0029)	(0.0031)	
insurance × Dummy	0.0080***	0.0132	−0.0029	0.0012	
	(0.0028)	(0.0083)	(0.0028)	(0.0030)	
clothing × Dummy	0.0029	0.0096	−0.0006	−0.0002	
	(0.0029)	(0.0086)	(0.0031)	(0.0029)	
other × Dummy	−0.0028	0.0001	−0.0030	0.0051	
	(0.0028)	(0.0079)	(0.0027)	(0.0031)	
Constant	0.4136***	0.4135***	0.4148***	0.4144***	0.3862***
	(0.0369)	(0.0366)	(0.0370)	(0.0368)	(0.0753)

(*continued*)

Table 2. (*Continued*)

	(1) Gender	(2) Tertiary	(3) Residence	(4) Key School	(5) PAI Growth
Other Controls	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y
Birth FE	Y	Y	Y	Y	Y
Num. of child. FE	Y	Y	Y	Y	Y
Obs	7811	7811	7811	7811	2709
R squared	0.1103	0.1110	0.1098	0.1105	0.1147

Notes: PAI and SPR variables are centred. Due to the table length, some control variables included in the estimation are not presented here. Robust standard errors shown in parentheses are clustered at the province-birth cohort level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.
Source: Created by authors using CFPS data.

assess whether a breadwinning mother can positively impact children's academic development. On the other hand, considering the association between women's bargaining power and their income share in households (Bennett, 2013), we therefore examine the impact of mothers versus fathers as the primary earners on household spending prioritisation. These findings are reported in Supplementary Materials Table SA7.

As seen in Columns (1)–(2), children with a breadwinning mother perform on average 2.23–2.44% better than their counterparts, while such a mother does not alter how children convert education spending into their development. In addition, Columns (3)–(4) utilise a dummy to account for scenarios where mothers are the equal or higher earners and Columns (5)–(6) employ another dummy that excludes situations where mothers earn as much as fathers. The results delineate a negative relationship between households led by breadwinning mothers and their spending priorities on education-relevant items.[19] There are two plausible reasons. First, the total household income is on average $2,359 higher when mothers are the equal or higher earners. As evidenced before, wealthier families do not maximally prioritise spending on education until they reach the richest status.

Second, as shown in Supplementary Materials Figure SB4(a), when mothers are the equal or higher earners, the share of their individual income compared to the total household income is often smaller than in scenarios where fathers are the primary earners. It is important to note that individual income here encompasses income from all types of jobs, including side jobs, although there might be other sources of additional earnings. Apart from potentially unidentified sources of income, this reduced share could be linked to living in lager families when mothers are the equal or higher earners. This trend is observable in Supplementary Materials Figure SB4(b), where 4% fewer families of 3–4 persons and 2.4% more families of more than 10 persons are evident when mothers are the equal or higher earners. Co-residing family members provide financial support but may simultaneously diminish mothers' bargaining power, especially considering the Chinese cultural preference for co-residence with sons (Lei, Strauss, Tian, & Zhao, 2015). Nevertheless, Columns (3)–(6) also point out that an increase in the ratio of mothers' income to total household income positively influences the prioritisation of education spending, consistent with earlier findings.

6. Discussions and concluding remarks

Children's human development is often evaluated as if the priorities, defined by those who care most about them, did not matter. By using the capability approach, we focus on the concept of ranking as a way of examining spending priorities and the effect of parental advantages on their children's development. Specifically, we assessed the role of parental spending priorities on their children's academic development using a sample of 8,422 Chinese children and adolescents

surveyed during 2012 to 2018. We found that families with the highest spending priority on their children's education achieved returns in academic performance ranging from 2.88 to 6.57% higher than those who gave the lowest priority to educational spending. Similarly, prioritising clothing and healthcare could yield maximum returns in child development ranging from 3.24–4.95% and 2.52–3.69%, respectively. When accounting for parent's higher education attainment, we found that the implied academic performance gains increased to 21.96%. In addition, our results further reveal a negative relationship between family income and the prioritisation of education spending. However, the situation reverses among richest families. Attending key schools particularly matters for children from worse-off families to convert spending priorities on education into their test scores. Moreover, an equally or higher-earning mother can enhance children's academic development by 2.23% to 2.44%, and an increase in the ratio of mothers' income to total household income can effectively foster household spending priorities on education.

Although the linkages between household educational expenditures and child development had been previously explored in the literature, this study brings new evidence to light, based on the capability approach. The core outcome in our view is how parents evaluate their children's academic abilities can be influenced by their spending priorities. We used the capability approach as a way of talking about 'reasons to value', linked to parental practices and spending prioritisation. This echoes Sen (2017) social choice work and the determination of the relevant informational spaces for evaluating people's advantages. The analysis employs a broader version of the capability approach, not restricted to capabilities, and encompasses plural informational spaces. It goes further to consider not simply capabilities *per se* but how people value those capabilities, and the concept of ranking used for counting these values shows how people order their priorities in this regard. The impact of the rankings is clearly seen in the results reported in this paper.

Thus, our paper provides novel insights into how parents can achieve comprehensive outcomes in their children's academic development. It goes beyond a consideration of parental practices and children's test scores. How parents convert their resources to enhance children's capabilities can be captured, not merely by how much they spend, but by the extent to which parents prioritise their children's education and culture over other expenditure considerations. Notably, other spending categories, such as medication, healthcare, sports, clothing and beauty, was also found to influence child development outcomes, to some degree.

As China advances to the status of a developed nation, its economy will require increasingly-higher skilled labour and, thus, a better-educated society (Borsi, Valerio Mendoza, & Comim, 2022). The state's long-term development vision and efforts toward boosting social mobility and promoting common prosperity are reflected in the banning of private after-school tutoring and the closure of independent colleges. The former was perceived to give an unfair advantage to wealthier families for whom private tutoring was more affordable, and independent colleges, prone to predatory practices, were considered as a lower-quality alternative to higher education. Nevertheless, the results of this paper suggest that equalising educational expenditure opportunities may not be enough. Households that are more willing to invest in children's education cannot be simply regarded as wealthier. Rather, as the results here reflect, such households could be those that value education more. Considering Confucianism, which formed the core of traditional Chinese culture, places great emphasis on education and academic achievement (Gu, 2006), Chinese parents who overlook or give up cultivating their children's education are likely to need help far beyond monetary assistance. This finding has significant implications for future educational policy. The reasons behind some households falling behind in prioritising their children's education may be explained, in part, by (a) traditional gender norms shaping beliefs that spending on a daughter's education is a waste, which, although changing as China modernises, could still bring lower expectations for girls than for boys (e.g. Chi & Rao, 2003; Liu, 2006), (b) parents holding a negative attitude towards the usefulness of study, possibly because they themselves are illiterate or less-well educated, and (c) an exaggerated emphasis on children's agency, in that children are expected to achieve outcomes by themselves through their own diligence and intelligence

without the need for parents to engage in developing real opportunities for their children to exercise this agency (Biggeri et al., 2011b). Given the newly-unveiled Three-Child Policy, both parents' perceptions and the actions consequent to their perceptions for the development of children's capabilities are now even more important for China, especially in view of the finding that the difference in children's academic performance could be enhanced by up to 6.57% in multiple-child families. The paper suggests that the value placed on children's development and future can be reflected in the order of relevant resources devoted to it. Policies that aim to reinforce personal and household values will provide additional returns in China's human capital accumulation.

Notes

1. All questionnaires were filled in by parents on behalf of their children under 10 years old at the time of the survey.
2. In addition, Heckman, Stixrud, and Urzua (2006) pointed out that aside from cognitive abilities, socio-emotional skills, such as perseverance, motivation, and self-control, had a direct impact on schooling decisions and test scores. Cunha and Heckman (2007) also demonstrated the interplay of cognitive and non-cognitive skill accumulation.
3. The pairwise correlation rate of the seven dimensions of SHD is between 0.22 and 0.50.
4. Despite the dimensional distinction, test scores and SHD are both an indication of academic development, a latent construct. With this in mind, we also ran a common factor analysis (CFA) to generate an alternate CADI, which accounts for 90.1% of the common variance of the nine variables.
5. The function converting from additional income to enhanced capabilities is likely to be concave (S. Anand & Sen, 2000), so the natural logarithm of income is often used in the HDI. A body of literature also demonstrates the non-linearity of family income and child outcomes, see Cooper and Stewart (2021).
6. 'Filial piety' refers to Chinese ethics rooted in Confucianism, emphasising attitudes of obedience, respect, care, and love towards parents.
7. In rural China, adult children are more likely to provide financial support to their elderly parents than their urban counterparts (Lee & Xiao, 1998). In contrast, due in a large part to sky-rocketing housing prices, adult children living in urban locations are now more likely to receive financial support from their elderly parents (Rosenzweig & Zhang, 2014). Further, Silverstein and Zhang (2020) found that grandparents tended to provide economic resources to their grandchildren in rural China.
8. The pairwise correlation rate of the ten dimensions of the SPR is between -0.01 and -0.22.
9. A total of 3476 children were surveyed only once. In addition, half of the rest observations have a difference of numeric value no more than 1 in spending priorities between survey waves.
10. Additionally, we estimated this equation using the CFA-based CADI and two components of the CADI, i.e., test scores and SHD, and report the results in Supplementary Materials.
11. We also estimate supplementary SPR indicators to further check the results.
12. This approach can avoid involving a non-parametric first stage, as do non-linear or frontier models, where functioning and resources cannot be clearly distinguished (e.g., Binder & Broekel, 2011; 2012a; 2012b). Further, compared to a sub-group analysis, it more precisely estimates the differential effect of the resources for each category of conversion factors.
13. The dummies are gender, tertiary education of parents (equals 1 if either of the parents received higher education, and 0 otherwise), urban area, and key school.
14. The same estimation using the CFA-based DV is reported in Supplementary Materials Table SA2. In addition, we replace the CADI with its components and report corresponding main results in Supplementary Materials Table SA3.
15. Since the ranking scale is 1–10, changing from the lowest to highest priority rank is nine-fold, so we multiplied the reported coefficients by 9 to account for an overall difference.
16. The effects of prioritising financial support and social donation on children's academic development is perhaps a result of parental altruism that some parents are more willing to invest in their children's human capital formation than others (Das, 2007).
17. To ensure sufficient variations, we restricted respondents to those who had been surveyed at least three times.
18. For using the tertiary dummy, they are utility-, necessities-, education- and transfer-relevant spending items, while for using the key school dummy, they are transport-, necessities-, healthcare- and transfer-relevant spending items.
19. We depict histograms of the education SPR in Supplementary Materials Figure SB3. Upon comparison, we notice that the distribution of the education SPR is more diverse when fathers are the higher earners. However, it's also more probable for the highest spending priority to be selected in this scenario.
20. Questions used to justify this factor are listed as QC1–QC3 in Table B1.
21. Chinese secondary schools are divided into 'key' and 'ordinary' schools. Designated key schools distinguish themselves from ordinary schools by their academic reputation and generally gain more educational resources in areas such as teachers, equipment, and funding. Students need to compete for admission to key schools, meaning that only the best cohort is entitled to study there.

22. The pairwise correlation rate of the six dimensions of parental practices provided by parents themselves is between 0.16 and 0.39.
23. Reaction (b), (c) and (d) are classified as negative. In contrast, reaction (a), (d) and (f) are classified as positive. Only reaction (g) is considered passive.
24. The test result suggests that the disturbance in our first-stage model is heteroskedastic. The levels of all exogenous regressors including fixed effects are involved.
25. ICC is calculated as the ratio of the between-group variance relative to the total variance in the sample. It describes the extent to which observations within province groups are similar to each other.

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Data availability statement

The data used in this study are open to the public on Peking University's online platform (https://www.isss.pku.edu.cn/cfps/en). The Stata codes can be made available to bona fide researchers upon request.

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Appendix A. Control variables

In addition to the CADI, PAI and SPR variables, we introduced 11 covariates to control for heterogeneity across samples; five at the child level and six at the parent and household level. These variables were derived from the stories that the CFPS data illustrate and assessed from a capability perspective. We elaborate on both these levels here.

Child-level covariates

The CFPS collected rich information concerning children's development. For instance, it records how many times a child went to hospitals or clinics in cities, towns, communities, or villages in the last 12 months. One can infer the status of children's health from this information. In addition, the CFPS registered information about whom the actual carers of a child were, and how many times per week, on average, the child met at least one of his or her parents. Based on these questions, we created a dummy specifying children who were not looked after by their parents in person and who saw neither of their parents per week.[20] Furthermore, the quality of teaching, the school atmosphere, and the peer culture can be associated with children's academic development (Lynch, Lerner, & Leventhal, 2013). In the context of China, attending a key school is both a reflection and a determinant of student achievement.[21] Hence, we created another dummy to distinguish students in key schools from those in ordinary schools. We also included gender and sleep time to control for individual heterogeneity.

Parent- and household-level covariates

A substantial body of literature examined the effects of parenting style on child health and student achievement (e.g. Burton, Phipps, & Curtis, 2002; Cui et al., 2019; Dooley & Stewart, 2007). Two variables were created in our dataset to control for parents' functionings. One accounts for parental practices, measuring the extent to which parents paid attention to and monitored their child's learning and recreational activities.[22] We also incorporated information based on the observations of home environment by the CFPS's interviewers, assessing to what extent parents were concerned with their child's education and actively communicated with their child. Questions in this regard are summarised in Appendix Table B1 (QB1–QB8).

A further covariate accounts for parents' reactions to their children's unsatisfactory test scores, which is closely related to our dependent variable (DV). The possible reactions are summarised as: (a) contact the teacher; (b) physical punishment; (c) scold the child; (d) ask the child to study harder; (e) ground the child; (f) help the child more; (g) take no reaction. We divided these options into three categories, i.e. negative, passive and positive.[23] Further, other covariates are the average age of parents and several dummies that refer to parental marital status, household residence (in urban or rural area), and a family's savings for children's education, respectively. Descriptive statistics of other variables are given in Appendix Table B3.

Appendix B. Summative tables and descriptive statistics

Table B1. Questions about test scores, SHD, parental practices & absence of parenting

	Content
Test Scores	
Rate: poor, average, good, very good	
Chinese	As far as you know, what was the child's average grade in Chinese language or grammar last semester?
Mathematics	As far as you know, what was the child's average grade in math last semester?
Study Habits & discipline	
Rate: strongly disagree, disagree, agree, strongly agree	
QA1	This child studies very hard.
QA2	When this child finishes his/her homework, he/she checks it many times to see if he/she did it correctly.
QA3	This child plays only after he/she finished his/her homework.
QA4	During class-time, this child is concentrated on the things he/she does.
QA5	This child respects the rules and the order.
QA6	Once he/she starts to do something, this child will complete it no matter what happens.
QA7	This child likes to keep all his/her school things in great order.
Parental Practices	
By parents themselves	
Rate: never, rarely (once a month), sometimes (once a week), often (2–4 times a week), very often (5–7 times a week)	
QB1	How often did you give up watching TV shows you liked to avoid disturbing your child when he/she was studying?
QB2	How often have you discussed what happens at school with your child since this semester/last semester?
QB3	How often did you ask the child to finish homework this semester/last semester?
QB4	How often did you check the child's homework this semester/last semester?
QB5	How often did you restrict or stop the child from watching TV this semester/last semester?
QB6	How often did you restrict certain types of TV programs the child could watch this semester/last semester?
By the interviewer	
Rate: strongly disagree, disagree, neither agree nor disagree, agree, strongly agree	
QB7	Home environment (such as child's artwork, books, or other study materials) indicates that the parents care about the child's education.
QB8	The parents take the initiative to actively communicate with the child.
Absence of Parenting	
If the answers are neither of the parents in QC1 and QC2 and 0 in QC3, then the dummy 'absence' is coded as 1, and 0 otherwise.	
QC1	Who mainly takes care of the child at daytime?
QC2	Who mainly takes care of the child at night?
QC3	How many times could the child meet his/her parent(s) per week on average?

Notes: Parental practices are measured with the geometric mean of the average normalised outcome of QB1–QB6 and QB7–QB8, respectively. We coded the answers into numeric values and assigned higher figures to more positive evaluations. English translation is in terms of the CFPS 2018 questionnaire.
Source: CFPS data.

Table B2. Descriptive statistics – spending priority ranking

Variable	Description	Obs.	Mean	Std. Dev.	Min	Max
Spending Priority Ranking						
diet	Spending priority for food and drink including eating out	17,291	7.94	2.32	1	10
transport	Spending priority for local transportation and post, and telecommunications	17,291	7.03	1.97	1	10
utility	Spending priority for rent, utilities and property management	17,291	6.48	2.02	1	10
necessities	Spending priority for daily necessities, home repairs, cars, other transport tools, furnitures and electrical appliances	17,291	6.56	2.20	1	10
healthcare	Spending priority for medication, healthcare and fitness	17,291	5.76	2.39	1	10
education	Spending priority for education, culture and recreation, and travel	17,291	6.95	2.24	1	10
donation	Spending priority for financial support given to others and social donation	17,291	3.73	1.79	1	10
insurance	Spending priority for business insurance	17,291	3.36	1.73	1	10
clothing	Spending priority for clothes and beauty (e.g. haircut, spa, cosmetics)	17,291	6.40	1.73	1	10
other	Spending priority for all other items	17,291	3.29	1.95	1	10
Time						
year	Year of survey	17,291	2013.33	1.47	2012	2019

Notes: The amount paid for some items was asked on a monthly basis. For calculation purposes, we converted them into annual quantities. The larger the value, the higher the priority. All statistics were adjusted using the sampling weights.
Source: Authors' elaboration using CFPS data.

Table B3. Descriptive statistics – children, parents & households

Variable	Description	Obs.	Mean	Std. Dev.	Min	Max
Child Level						
CADI	Normalised arithmetic mean of learning processes and outcomes	12,658	0.6220	0.1841	0	1
score	Test scores	14,433	2.78	0.0298	1	4
SHD	Study habits and discipline	14,270	3.57	0.0182	1	5
child gender	Boy = 1; Girl = 0	17,291	0.5144	0.4998	0	1
child age	Age	17,287	10.83	2.97	6	16
key_school	Enrolled in a key school = 1; Not = 0	13,764	0.2514	0.4338	0	1
sleep	Hours of sleep on weekdays	16,520	9.03	1.02	5	13
child health	Frequency of visiting hospitals and clinics in the last 12 months	16,987	1.12	2.37	0	122
absence	Not staying with and rarely see parents = 1; Otherwise = 0	17,038	0.0573	0.2324	0	1
Parent/Household Level						
PAI	Normalised arithmetic mean of health, education and household net income per capita	13,875	0.4117	0.1056	0	1
health	Self-evaluated health status	32,441	3.13	0.0325	1	5
education	Years of schooling	32,022	2.70	0.0906	0	18
family_income	Household net income per capita (log)	31,108	8.80	0.0603	−1.61	15.23
parent_age	Average age of parents	17,134	38.32	5.46	22	83
marital	Divorced or widowed = 1; Married = 0	14,725	0.0429	0.2027	0	1
parental practices	Normalised geometric mean of parental practices	12,403	0.6170	0.1482	0	1
reaction	Reaction to child's unsatisfactory test scores: positive = 3; passive = 2; negative = 1	15,613	2.78	0.6108	1	3
edu_savings	Saved money for child's education = 1; Not save = 0	16,965	0.2043	0.4032	0	1
child number	The number of children	17,291	1.67	0.8478	1	8
residence	Live in urban areas = 1; Rural = 0	16,836	0.5220	0.4995	0	1

Note: All statistics were adjusted using the sampling weights.
Source: Authors' elaboration using CFPS data.