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Abstract

The absence of good parenting practices may affect children's cognitive and motor development. In this paper, we use a mixed-methods approach to explore the prevalence of childhood developmental delays as well as parental attitudes towards an understanding of parenting methods. The results demonstrate that 42.0% of children in the sample have delayed cognitive development and 10.2% have delayed motor development. Despite the fact that most caregivers reported that they enjoyed spending time with their child (88.6%) and believe it to be their responsibility to help their child learn about the world around them (94.9%), only 12.6% of caregivers read to their children, and the majority of caregivers did not sing to their children (62.5%) or use toys to play with their children (60.8%). Moreover, we find a significant positive correlation between singing, reading, and playing behaviors and children's cognitive and motor development. Three main constraints influencing parenting behaviors are: (1) caregivers do not know that they should be engaging in these parenting behaviors at this stage in the child's development; (2) caregivers do not know how to interact with their child in ways that are constructive towards their development; and (3) caregivers do not have time to engage in constructive parenting behaviors.

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Abstract

The absence of good parenting practices may affect children's cognitive and motor development. In this paper, we use a mixed-methods approach to explore the prevalence of childhood developmental delays as well as parental attitudes towards an understanding of parenting methods. The results demonstrate that 42.0% of children in the sample have delayed cognitive development and 10.2% have delayed motor development. Despite the fact that most caregivers reported that they enjoyed spending time with their child (88.6%) and believe it to be their responsibility to help their child learn about the world around them (94.9%), only 12.6% of caregivers read to their children, and the majority of caregivers did not sing to their children (62.5%) or use toys to play with their children (60.8%). Moreover, we find a significant positive correlation between singing, reading, and playing behaviors and children's cognitive and motor development. Three main constraints influencing parenting behaviors are: (1) caregivers do not know that they should be engaging in these parenting behaviors at this stage in the child's development; (2) caregivers do not know how to interact with their child in ways that are constructive towards their development; and (3) caregivers do not have time to engage in constructive parenting behaviors.

Keywords: parenting; early child development; qualitative study; mixed methods analysis; rural China

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Introduction

Research has shown that experiences in the earliest years of a child's life can have a significant impact on future outcomes, suggesting that focusing attention on these years is one of the most effective ways of promoting lifelong cognitive, physical and social development. Many researchers have demonstrated that the development and malleability of the neural system during these early years is critical for the emergence of cognitive and motor skills (Huttenlocher, 1979; Thompson and Nelson, 2001; Knudsen, 2004; Knudsen et al., 2006). Investments in human capital accumulation at this age can promote a lifetime of positive outcomes (Heckman, 2008; Gertler, 2014). Even the first months of life can be important for development and can affect the individual for his or her entire life (Almond and Currie, 2011).

The importance of this early stage of development has prompted scientists and social scientists to search for specific factors that may be associated with cognitive development during this period. As early as the 1990s, the literature had already extensively documented the link between poor nutrition and low levels of both cognitive and motor skills among infants and toddlers (Hsueh et al, 1981; Goodwin et al., 1983; Behrman, 1996; Martorell, 1997; Grantham, 1999). More recently, however, studies have shown that the home learning environment that parents provide for their children is also closely linked with children's cognitive, social and motor performance (Chang et al., 2009; Park, 2012). Specifically, a number of researchers have demonstrated the importance of parental involvement in children's early childhood activities (Parker et al.,

1999; Rimm-Kaufman et al., 2000). Reading, telling stories, and singing songs together have all been linked to early language acquisition and improved cognitive development (Bus, 2001; Evans et al., 2000).

As most of the recent literature on parenting practice has been conducted within the context of developed countries, little is known about the home environment-based determinants of cognitive growth in developing countries. Further research in this area is necessary, especially considering that the share of children with cognitive delays is higher in developing than developed countries (McGregor et al., 2007; Emerson et al., 2011). Several studies have shown that interventions to improve parental investments can be successful in developing settings (Attanasio et al., 2015; McGregor et al., 2014). However, there is almost no work in developing countries that describes the home learning environment in a way that might begin to provide insights into precisely which factors might be linked with these delays.

While there is a lack of rigorous empirical research on the level of cognitive development among infants and small children in China, several papers suggest that this might be a significant problem. Children residing in rural areas appear to have lower levels of cognitive development than do children in urban areas (Yang et al., 2008; Bao et al., 2011; Wei et al., 2015; Luo et al., 2015; Chen et al., 2012). Luo et al. (2015) find that 20.0% of rural Chinese 6-12 month olds are delayed in their cognitive development, while 32.3% are delayed in their motor development. Only one study by Wei et al. (2015) examines the underlying factors behind such high rates. The findings of this study point to insufficient learning activities or toys, caregivers' depression, and having siblings as significant correlates of delayed child development (Wei et al., 2015). However, to our

knowledge, there has been no further empirical work conducted in rural China on the home learning environment or on the parenting practices associated with cognitive delays.

The purpose of this study is to better understand the underlying factors that influence parenting practices, and subsequently children's development, in poor counties of rural China. In order to accomplish this goal, we use a mixed-methods approach, which explores the prevalence of developmental delays among children, parental attitudes toward children, parenting practices, and potential reasons for less than ideal parenting practices. A mixed-methods analysis is capable of measuring the complex set of value judgments and decisions that determine parenting behaviors and that can affect early child development. This research approach is able to complement the empirical rigor and generalizability of quantitative research with a contextualized depth of understanding provided by interview-based case studies. Our research design, therefore, offers a unique opportunity to understand individual parenting practices without boxing them into a finite list of choices pre-selected by the researcher. Such research might help improve future intervention targeting and design.

In this paper, we use quantitative data from a large-scale quantitative survey of 1,422 parents or other caregivers (henceforth, *caregivers*) of children aged 18-30 months living in poor and rural parts of China. We first summarize the state of early child development and parental attitudes towards children among this population. In terms of parental attitudes, we focus not only on the willingness of caregivers to spend time engaging in parenting activities, but also on the parenting behaviors that caregivers engage in with their children. These include activities such as reading, singing, and caregiver-child play (henceforth, *parenting behaviors*), all of which have been linked to

improved cognitive and social-emotional development. Second, we use a set of qualitative interviews to investigate whether rural parents recognize a developmental gap between rural and urban children and whether they are aware of any link between parenting behaviors and child development. Our qualitative analysis also explores the factors that shape current parenting behaviors in poor areas of rural China.

Quantitative Data and Results

Sampling Procedure and Data Collection

Our quantitative data were collected from a survey of 1,442 households in 351 villages across 174 townships in 11 nationally-designated poverty counties located in Shaanxi Province.* At the time of the four-week data collection period in October, 2014, the sample children were aged 18-30 months. Teams of trained enumerators collected socioeconomic information from all households participating in the study. The teams identified each child's primary caregiver (the individual who carries the most responsibility for the child's care) and administered a detailed survey on infant, parental, and household characteristics.

All children were also administered the Bayley Scales of Infant Development (BSID) test, an internationally recognized, scaled test of infant and toddler cognitive and motor development (Bayley, 1974). The American Psychiatric Association lists the BSID as a way to diagnose certain developmental disorders (American Psychiatric Association, 2000). The test was formally adapted to the Chinese language and environment in 1992;

* Families living in nationally-designated poverty counties have an average per capita income that puts them at 67-187% of China's poverty line (Wang, 2010). They also tend to have high rates of migrant worker outflow, a general lack of fertile cultivated land, and poor transportation infrastructure (Guo and Zhang, 2008).

as part of this process, the standards for impairment have been recalibrated based on a sample of 2,409 normally functioning Chinese infants and toddlers, aged 2 to 30 months (Yi et al., 1993).

All BSID enumerators attended a week-long training course on how to administer the BSID, including a 2.5 day experiential learning program in the field. Enumerators administered the test one-on-one in the household using a set of standardized toys and a detailed scoring sheet. The BSID takes into consideration each infant's age in days, as well as whether he or she was a premature birth. These two factors, combined with the infant's performance on a series of tasks using the standardized toy kit, contribute to the establishment of two independent, internationally standardized scores: the Mental Development Index (MDI) and the Psychomotor Development Index (PDI). The MDI evaluates memory, habitation, problem solving, early number concepts, generalization, classification, vocalizations and language to produce a measure of cognitive development, while the PDI evaluates gross muscle groups (rolling, crawling and creeping, sitting, standing, walking, running and jumping) and fine motor manipulation to produce a measure of psychomotor development (Bayley, 1969). To determine that a given child is experiencing a developmental delay, we first scaled each index to have an expected mean of 100 and a standard deviation of 16, where scores on each index can range between 50 and 150 (Yi, 1995). As per the official standards, we then defined an impairment for each index as a score lower than 80.

The BSID test is highly reliable. Previous validating studies have shown an inter-rater reliability of 0.99 for each of the two sub-indices: MDI and PDI (Yi et al., 1993). Both indices are described in more detail below. The test-retest reliability is high, at 0.82

for MDI and 0.88 for PDI (Yi et al., 1993). The parallel forms reliability is also high, at 0.85 for MDI and 0.87 for PDI, indicating that the test scores are consistent when there is a variation in the methods or instruments used in the test (Yi et al., 1993). This study represents one of the largest administrations of the BSID ever conducted in China.

The survey also included a series of questions about the parenting environment in the home. Enumerators first asked parents about their willingness to play with and spend time with their children. Then, enumerators asked more objective questions about exactly how much time parents spent engaging in specific activities with their children, including reading, singing and using toys to play.

Role of the Funding Source

The study sponsors had no role in study design; in the collection, analysis, or interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

Quantitative Results

Developmental Delays

The study found high rates of developmental delay among sample children (Table 1). A total of 42.0% of the children surveyed had an MDI score below 80, indicating that almost half the children were delayed in their cognitive development. A total of 10.2% of the children had a PDI score below 80, indicating delayed psychomotor development.

Parental Attitudes

The data show that caregiver indifference is not a problem among our sample population. In fact, we find the opposite (Figure 1A). The vast majority of caregivers (88.6%) report that they enjoy spending time with or are willing to spend time with their

children. Most caregivers also indicate that they find playing with their children to be fun and interesting (83.7%). Nearly all caregivers (94.9%) report that they feel it is their responsibility to help their children learn about the world around them.

Parenting Behaviors and Child Development

Despite the caregivers' strong reported sense of responsibility and high reported levels of care, love, and concern for their children, our study finds current practices in rural households are not consistent with good parenting behavior (Figure 1B). Only a small fraction of caregivers (12.6%) read to their children on the day prior to the survey being administered, and the majority of caregivers did not sing to their children (62.5%) or use toys to play with their children (60.8%) on the day prior to survey administration.

Out of the many household characteristics we measured, we find two major correlates of best parenting practices: maternal education, and the caregiver's relationship to the child (Table 2). More specifically, when the child's mother is better educated, the caregiver (regardless of relationship to the child) is more likely to read or sing to the child. In addition, holding other factors constant, when the caregiver is the child's mother, she is more likely to engage in best parenting practices, including reading and singing to the child. By contrast, the household's income status (as proxied by whether or not the family receives Minimum Living Standard Guarantee Payments) is not significantly correlated with parenting behaviors.

Our quantitative data further show that the lack of good parenting behaviors is significantly associated with delays in both cognitive and motor development, even when we control for other characteristics such as child's gender, child's age, premature birth, whether the child is an only child, whether the child's mother was identified as the

primary caregiver, maternal educational level and age, and whether the family received Minimum Living Standard Guarantee Payments (Table 3). In households where an adult reads to the child, children's MDI and PDI scores are higher than they are for children in households without reading ($p < 0.01$). Specifically, when caregivers read to their children, MDI scores are 7.04 points higher than otherwise. The study also found similar significant positive correlations between singing or using toys to play with the child and both MDI scores ($p < 0.01$) and PDI scores ($p < 0.01$).

Summary of Quantitative Results

The findings of the quantitative study are clear, if somewhat puzzling. There are high levels of cognitive delay among sample children aged 18-30 months. These delays seem to be linked with the absence of an active and stimulating home environment. The question remains, however, as to why the home environment is so lacking in age-appropriate stimulation. Our data suggest that parents are neither ignorant of the gap between their children and more privileged urban children, nor are they unwilling to spend time or monetary resources on their children. In the next section, we turn to our qualitative analysis in order to examine more closely other possible reasons for the poor parenting environment in China.

Qualitative Findings and Mixed-Methods Analysis

Qualitative Data Collection

As part of our effort to better understand why rural households lack good parenting behaviors, we conducted interviews with a subset of households that had participated in the quantitative data collection described above. In total, we visited 42 households in 11 villages across 10 townships in Danfeng and Shangnan Counties of Shaanxi Province. Within each sample household, we spoke specifically to caregivers of children aged 1-3 years old. All interviews were conducted one-on-one and transcribed. Each interview lasted from thirty to ninety minutes and was semi-structured: interviewers followed a scripted interview protocol but also had the freedom to diverge from this protocol in order to investigate specific stories that emerged.

A Framework for Understanding Parenting Behaviors

Our qualitative interviews focused on two main themes. First, we wanted to learn whether caregivers recognize that there is a problematic developmental gap between rural and urban children. Next, we aimed to understand the reason for the lack of good parenting behaviors by focusing on five potential issues:

1. Financial constraints
2. Parental indifference towards their children (i.e., lack of affection or aspirations for children's future)
3. Ignorance of any link between parenting behavior and children's development
4. Ignorance of what good parenting behaviors are
5. Time constraints

Our reasons for focusing on these five potential factors are as follows. First, if rural families do not have the financial means necessary to invest in toys, books, and

other educational materials for their children, then poverty can constrain parenting practices. Second, even if poverty is not a constraint, uninvolved and indifferent parental attitudes, combined with a lack of long-term aspirations for the child's future, could result in an absence of good parenting behaviors. Third, caregivers in rural areas may simply not know that young children in a critical development phase benefit from parenting practices such as reading, playing, and singing. This absence of understanding could pose a constraint even if caregivers were financially able to provide parenting inputs and were willing to take the time to do so. Fourth, even if caregivers understand the importance of such practices, if they cannot access information on how to properly engage with their child they may be less willing and able to do so. Finally, even in situations where caregivers have sufficient financial resources and information to engage in good parenting practices, time constraints could still limit their ability to do so consistently.

In the rest of this paper, we present caregiver attitudes on these five topics as revealed through our qualitative interviews in an effort to identify the main factors shaping current parenting practices in poor and rural areas of China.

Identifying and Understanding the Developmental Gap

The first step in beginning to understand how parenting practices affect children's cognitive outcomes is determining whether rural parents recognize the developmental delays in their children and the issues these delays present, as this could potentially be the root cause of poor parenting practices. While our quantitative data already suggests that parents are cognizant of the lag between their children and urban children, we believe that the qualitative data adds value by providing more context and detail on this subject.

Consistent with the quantitative evidence, most caregivers in our qualitative sample expressed a general understanding that rural children were different than urban children.

“I don’t want him to play with other village children. I want him to play with city kids. There aren’t many things to see in the countryside. The development of rural children just can’t compare to the development of city children.” (Father 150104)

“City kids have more caretakers, and don’t play with mud and water; rural kids play with mud no matter what their age. My daughter’s development is the same as that of rural kids, but behind that of city kids.” (Mother 140101)

Almost all of the caregivers we interviewed believed urban children to be more intelligent than rural children.

“I think that there are a lot of differences between rural and city children. City children are more outgoing. Rural children aren’t as smart as city children.” (Grandmother 150101)

“There is an education gap between city and rural kids. Rural kids receive less instruction than city children. My daughter’s development is the same as that of other rural children, but rural children cannot be compared to city kids.” (Mother 130102)

Caregiver beliefs about the source of the urban-rural developmental gaps

Having established that nearly all caregivers recognize the issue of cognitive delays in their children, we next draw upon the qualitative interview results to shed light on caretakers’ views on why their children are underperforming, and to offer an explanation as to why caretakers do not engage in better parenting practices to improve their children’s outcomes.

Financial Constraints

All of our research was conducted in nationally-designated poverty counties. This means that, on average, the families in the sample areas are among the poorest in China.

Our sample areas are also all mountainous areas with limited resources and poor infrastructure, in terms of transport and communication.

Though our research was conducted in areas of high poverty, this does not necessarily mean that families are unable to financially provide for their children. China's rapid development over the past decade and the emergence of off-farm employment has helped increase incomes for the vast majority of China's poor families (de Janvry et al., 2005; Leones & Feldman, 1998). By 2011, only 6.3% of the population could be considered to be living in poverty by international standards (World Bank, 2011). The benefits of this rapid development can be seen especially in the case of young working age individuals, age 16-35 years of age, who have almost universal access to off-farm employment (Li et al., 2013). With the rising wages that characterize China's labor market (Yang et al., 2010; Li et al., 2013), it seems that most families should be able to afford basic materials for good parenting.

Indeed, our qualitative interview data show that the majority of caregivers indicate that they do have the financial resources to invest in their children:

“I think it's important to buy toys she wants; we buy our toys in the city.” (Father, 150104)

Families also mentioned that they would buy whatever books their child wanted or needed, and had the financial capability to do so:

“We have children's books. We buy whatever books my daughter likes.” (Mother, 120402)

“We'll buy whatever books we have to, it's not a matter of money.” (Father, 150104)

Overall, we found that most families did not believe that financial limitations affected their purchases of books or toys for their children. There were exceptions, however.

Several caregivers frankly stated the following:

“Our household conditions aren’t good; he sometimes wants toys but I can’t buy them for him because we can’t afford it.” (Mother, 120101)

“We will send her to a better school if we can afford it by then, but it is enough for me if she stays healthy. People in villages don’t think about how to raise children or plan for school, we’re focused on feeding her and making sure she doesn’t get sick.” (Father, 150101)

In summary, most of our respondents expressed that they do have the financial resources to invest in their children. The larger problem seems to be that parents are not always spending money on their children in an age appropriate manner. For example, most families we interviewed spent a large fraction of their household income on baby formula, up to tens of thousands of RMB per year, even though their children were well past the age when pediatricians recommend baby formula as part of a healthy diet. Additionally, many parents purchased books and toys that were more appropriate for a school-aged child than for a toddler, or spent hundreds of RMB on large, expensive toys that their children ignored. In these households, the poor reception of these well-meant but inappropriate purchases often led to caregiver reluctance to make additional investments in toys or books.

Lack of aspirations for children’s future

Even when poverty does not constrain parenting practices, children’s cognitive development can be limited if caregivers do not care about raising their child to be smart or successful. In traditional societies, economists and other social scientists have often

portrayed children simply as a necessary input for household survival (Robinson, 1997). Children have been modeled as an asset for building families, as future laborers on the family farm, or as a guarantee of security in old age (Leibenstein, 1957; Robinson, 1997). Under this theoretical model, parents are expected to invest in children's development in order to benefit themselves in the future and not necessarily with the goal of helping children to develop the capacity to rise out of poverty.

This attitude does not seem to be the prevailing one in our sample. Our quantitative survey data (reported above) already cast doubt on this hypothesis, as parents demonstrated aspirations for their children without concern for their personal future returns. This finding was also reflected in our qualitative interviews. Many of our caregiver interviews indicate that caregivers have high hopes for their child's future success.

“I saw something on TV about how Americans are better than Chinese at 28 years old. I don't want my grandson to fall behind in the world.” (Grandmother, 150102)

“I hope he can do whatever he wants in life.” (Mother, 120101)

Most respondents identified academic achievement as a desirable goal, particularly as a means to leave the village, avoid farm-based employment, and establish a path to a better life.

“I hope she has a good future. I hope she will be better than her dad. These days, if you don't go to college, there's no future in the village.” (Grandmother, 130101)

“I hope he will study well. I want him to get into a good school, do well in school, and go to college or maybe work in a bank like his older cousin.” (Grandmother, 110102)

“I want my grandson to go to school. I did a lifetime of farm work, and I don't want my grandson to go through that. I hope he leaves the village to see what life outside is like.” (Grandmother, 120401)

Our findings suggest that overall, children in poor and rural areas of China today are not seen merely as instruments to leverage family success. Instead, almost all caregivers have high aspirations for their children and want them to be happy, regardless of whether or not this directly benefits the household. As such, the lack of reading, singing, and playing with children observed in the quantitative data does not seem to stem from caregiver indifference.

Ignorance of any link between parenting behavior and children's development

Though the previous two sections demonstrate that most families have both the resources and the will to engage in good parenting behaviors, parents still may not practice these behaviors if they do not know that they should be providing stimulation for their child. Indeed, our qualitative interviews suggest the caregivers do not recognize the significance of interactions with their children.

In rural areas, where parenting methods are often based on trial and error, if a child is unresponsive to any particular form of stimulation, families simply stop engaging in that form of stimulation. But many positive forms of parental engagement do not lead to immediate visible responses from the child. For example, babies and toddlers may be too young to respond verbally to adults, but speaking directly to them still leads to increased brain activity and development. Without access to information that reinforces the importance of consistent interactions with children, it is easy for the rural caregivers to perceive the child's lack of visible response as an indicator that these interactions are ineffective, unimportant, and unnecessary.

“We don't tell him stories because he can't understand; he doesn't respond. He can't even follow basic instructions like 'don't go outside,' so how could he follow a story?” (Father, 120202)

“There are no children’s books in the house. She wouldn’t understand if I read to her; she wouldn’t read the books, and would rip the pages instead. It is not important to read to her before school.” (Mother, 130102)

“His mom bought him three books last year on her way home from work, but he tossed them aside and never looked at them, so we sold them. Sure – it would be nice to learn a little from books now, but it’s not necessary.” (Grandmother, 120101)

Most of the caregivers we interviewed also believed that their child was too young to be read or sung to. When asked if they had books for their child, both the father and grandmother of one child laughed and said, “He can’t understand yet; he’s too young.” (120202)

Many families believed that a child’s understanding will increase dramatically once they attend school, and as a result they wait until the child goes to school to further engage with them.

“I think she’s too young to understand much now. She’ll understand more once she goes to school, so I’ll teach her more then.” (Grandmother, 150103)

“I think singing can be learned in school; her older sister learned it in school.” (Mother, 130102)

Other families did not prioritize interacting with their children, often placing greater importance on feeding and clothing the child. This reinforces the notion that caregivers are not aware of the long-term developmental importance of such parenting practices.

“The most important stuff to teach her before school is basic stuff like using the bathroom. And manners.” (Mother, 140101)

“I think he’s old enough to understand stories now, like ‘Snow White’ and ‘Robinson Crusoe,’ but we only read to him when he’s bored or lonely. It’s frustrating because he doesn’t really listen. Reading is not very important to me; eating well and staying healthy are enough for me to worry about.” (Grandmother, 150103)

“She has a few toys. I think I should buy more food and clothes for her instead of toys. Toys are unnecessary.” (Mother, 140101)

Some caregivers sang, read, or played with their child, but did not do so frequently because they used such interactions for other purposes, such as placating the child or putting him or her to sleep. Again, this reflects a lack of understanding of the impact such parenting behaviors have on the child’s cognitive and motor development.

“I think the most important thing is that he’s happy and doesn’t cry. The only purpose of playing is to keep him from crying or fussing.” (Grandmother, 120201)

“I don’t know if singing is important for her personal growth. I don’t think so. I sing to her to calm her down.” (Grandmother, 150103)

“Toys are not necessary but I buy them because I don’t want her to cry in public.” (Mother, 140101)

All of the above examples point to the conclusion that most families in rural and poor areas of China are fundamentally unaware that the first years of life comprise a crucial period of development and that parenting practices—such as reading, singing and playing with the children—have lifelong implications. Our interviews showed that many families had never considered the impact such interactions have on their child’s development. When asked whether she thought singing to the child is important, one grandmother responded:

“What’s important got to do with it? He likes it and that’s enough.” (Grandmother 120201)

“We haven’t thought about the connection between playing with him and his development; there probably isn’t a link.” (Mother 120202)

These responses suggest that one constraint on quality parenting in poor and rural areas in China is a lack of understanding among caregivers of the effect that stimulating activities have on children’s development. Among caregivers, there is little understanding

of the links that exist between reading, singing and playing with toys and the development of their child's cognitive or psychomotor skills.

Ignorance of what good parenting behaviors look like

The constraints on children's development that arise when caregivers fail to recognize the link between parenting practices and developmental outcomes can be further exacerbated when caregivers do not know *how* to engage in good parenting behaviors. In this section we examine how much caregivers know about what good parenting practices look like.

How caregivers receive information on how to parent their child can shed light on the quality of parenting activities. Data (not shown) from our quantitative study show that most rural parents receive information on parenting from their own trial and error experience (25.2%) or from friends and family members (especially mothers and mothers-in-law — 52.6%). Interviewers also found that some caregivers report getting information from TV shows that happen to include parents with young children. It is therefore not surprising that the quality of parent-child interactions is not as high as it might be, and that many caregivers directly acknowledge a need for more and better information on how to parent their child.

In certain situations there were hard constraints barring caregivers from engaging in quality parenting behaviors. Many of the caregivers we spoke to—especially grandmothers—said that they were illiterate. Being illiterate understandably limits the ability of caregivers to read or tell stories to their children. Also, some caregivers said that they did not know or could not remember any stories. This may be a result of generational parenting practices, as in several interviews we were told that caregivers

could not tell their child any stories because they themselves were not told stories when they were children.

“I’m illiterate and can’t take good care of him.” (Grandmother, 120201)

“I think telling stories is important, because it can help her develop her intelligence. But I never went to school and I don’t know how to read, so I don’t know how to tell stories.” (Grandmother, 150101)

“[I don’t know any stories because] as a kid, no one told stories! Who had time for stories? I was one of 10 kids; we had to help around the house and in the field.” (Grandmother, 120201)

Caregivers voiced similar concerns with regard to singing to their children. In several cases, the primary caregiver either did not know any children’s songs, or was not able to sing songs in a way that the child would understand.

“I think that singing children’s songs to my granddaughter is important but nobody in our family knows how to.” (Grandfather, 120301)

“I struggle to sing clearly so that he understands. I sometimes get the lyrics or pronunciation wrong.” (Mother, 120101)

Although most caregivers said that they played with their children, many did not do so frequently or regularly. Also, our interviews revealed that when caregivers did play with their children, they did so randomly and seemed to be unaware of any structured games to play with their child. However, caregivers recognized the importance of playing together and many remarked that they wished that there were a designated place they could go to learn how to play with their children.

“I play with my granddaughter. I take her outside everyday and I think she enjoys it. Sometimes I don’t know what games to play with her, but I still think it’s important.” (Grandfather, 120301)

“I want to learn more about how to play games with kids.” (Mother, 120102)

When asked what they hoped to teach their children before they began school, a majority of caregivers had some idea of the skills or knowledge they had attempted to instill or were planning to instill in their children. However, almost all interviewed caregivers noted that their own level of learning was a major obstacle in their ability to adequately teach their children. One common grievance was that they did not know many, if any, Chinese characters and were therefore unable to adequately prepare their children for school.

“The hardest part of parenting is teaching characters, drawing, and writing his name when I don’t know how to myself.” (Grandmother, 120201)

In most cases, caregivers put an importance on teaching basic academic concepts to their children before they attend school.

“I want to teach her simple numbers, Mandarin, children’s songs, and manners, but right now she is too young and can’t remember anything. My own Mandarin isn’t that good, so it’s hard to teach her. I don’t know how to teach her numbers. I need to teach her simple numbers and Mandarin so that she will understand in school.” (Mother, 120102)

“I don’t know how to teach or raise him. I want to teach him how to write numbers. To prepare for school, I teach him very basic characters and counting. I don’t do enough to prepare him. I think I should do other things such as teaching him how to play with other kids, and I want to teach him more characters. I haven’t done more because I don’t have the ability to; I only went to middle school. It’s important to teach these things because it is Chinese tradition to educate kids from a young age.” (Mother, 120101)

Some caregivers also pointed out that they didn’t know enough about the world around them and that this lack of knowledge was the main obstacle to educating their children.

“I explain to her what cats and dogs are, but I can’t explain animals that she sees on television if I don’t know what they are myself.” (Mother, 120102)

Others expressed a desire to know more about how to teach their children. In certain cases, even if caregivers knew certain skills or concepts themselves, they struggled to communicate them to their children effectively.

“I’ve thought about drawing 3 apples and teaching him how to draw, but it’s hard to teach him. He scribbles over what I try to explain. I just don’t know enough about teaching. There aren’t any television programs for teaching children before preschool.” (Grandmother, 150102)

Often, caregivers indicated that they lacked knowledge about parenting in a more general sense as well. Almost universally, they stated that they obtained most of their information from either trial and error or by watching television. When raising their grandchildren, grandmothers tended to rely on their experience raising the child’s parent. Some also remarked that they gained some information from talking to other parents and relatives.

“I want more information on teaching her. I only know what people tell me and what I see on my cell phone and on television. I also watched my older sister raise her child. Otherwise, I learn from trial and error.” (Mother, 140101)

“I don’t really know how to take care of little kids.” (Mother, 120102)

Based on our interviews, there is a distinct absence of knowledge about how to parent. It is clear that even if caregivers could be convinced of the link between parenting and cognitive development, many would not know how to engage in good parenting behaviors. Most caregivers simply do not know how to parent and have limited access to resources from which they can learn.

Time Constraints

We found through our interviews that even in cases where caregivers recognize the importance of parenting behaviors, and have both the resources and ability to practice

these behaviors, time constraints still often prevent them from engaging in quality parenting behaviors. Parents spoke of being busy and complained of frequent exhaustion due to the hard labor involved in farming.

“We don’t tell him stories...We are all super busy growing mushrooms. At certain times of the year, we only sleep four to five hours per night due to the busy mushroom growing season.” (Father, 120202)

Even when the parents were engaged in off-farm work, caregivers still reported heavy time constraints. When parents work in larger towns or cities for higher wages, they leave less able-bodied grandparents at home in the village to raise their children. Many of the grandparents we interviewed who identified the importance of reading, playing, or singing to the child could not engage in these activities due to lack of time.

“Reading is good because it helps her recognize characters. We have two books of characters that her mother bought. But I don’t have time to read.” (Grandmother, 150105)

“How could playing not be important? But we don’t play games. I don’t have time.” (Grandmother, 150105)

“I want to draw with him, teach him to sing, and recognize a few characters but I don’t have time. I don’t think I do enough. There just isn’t enough time.” (Grandmother, 150102)

When asked to provide more details on how caregivers spend their time, responses were vague. A typical day seems to consist largely of farm work, meal preparation, and household chores. Directly engaging with children seems to be one of the lowest priorities, possibly because of caregivers’ aforementioned ignorance of the importance of such interactions.

Whatever the reason, the existence of such heavy time constraints is troubling because—at least in some cases—it undermines the efforts of the rare population of

caregivers who both recognize that they should be engaging with their child and know how to properly do so.

Conclusion

In this paper, we pinpoint the inconsistency between good parental attitudes and poor parenting practices in poor and rural parts in China. Pulling data from both a large-scale, quantitative survey, and a smaller, interview-based qualitative survey, we find that engaging in activities such as reading, singing, and playing with young children aged 18-30 months is significantly associated with better psychomotor and cognitive development, and that failing to engage in these activities is significantly associated with a developmental delay. Given these correlations, a lack of proper parenting behavior is likely to be at least partly responsible for high rates of cognitive delays in developing areas of China.

Despite this, the majority of caregivers we surveyed did not engage in best parenting practices. However, the quantitative data showed that this lack of involvement did not result from parental indifference towards their children, as almost all caregivers reported feeling responsible for their child's development and having high aspirations for their child. Our qualitative results further complicate the issue, as we find that rural parents are in fact somewhat cognizant of the developmental delays their children exhibit.

We structured our qualitative interviews around five potential constraints that might be keeping caregivers from engaging in best parenting practices. Our results lead us to discount two of the possible reasons (financial constraints and indifferent parental attitudes) as major factors in the lack of parental investment in children. Instead,

caregiver ignorance of the link between parenting behavior and child development, a limited understanding of how to engage with their children, and time constraints appear to be the main factors preventing parents from engaging in best parenting practices.

Like other middle-income nations, China is increasingly shifting its emphasis from low-wage to higher-wage services and industries. As the economy shifts and wages rise, individuals will need more schooling in order to gain the necessary skills and knowledge that these jobs require. Early developmental delays in cognitive and psychomotor development undermine one's ability to learn, and in China's changing economy, individuals who suffer from these delays will likely struggle to find gainful employment in the formal sector. Therefore, if the government aims to implement policies that will improve children's cognitive abilities and by extension, the nation's future development, an effective route would be through encouraging quality parenting behaviors among caregivers of rural children.

Two of the main constraints that we have addressed in this study (failing to recognize the importance of engagement with the child and not knowing how to do so) arise due to a lack of sufficient access to information on parenting in rural areas. But while urban areas in China have a mature telecommunications infrastructure, China's rural areas still lack many of the resources needed for information sharing. Therefore, we suggest that further interventions attempt to address these communication deficiencies. Moreover, dissemination of information should target all caregivers: parents and grandparents alike. Even though the mothers in our sample were more likely to report engaging in good practices, there were many who did not possess the knowledge of why and how their engagement could impact their children's future development.

While most villages have healthcare resources in the form of village doctors and health clinics, provider quality is low. A recent study on the quality of rural health care found that only 20% of rural clinicians had a high school (or equivalent) education, and none had a college degree (Sylvia et al., 2014). Moreover, the treatments recommended by rural clinicians for patients presenting with common illnesses were correct only half of the time (53%—Sylvia et al., 2014). This stark reality speaks to a need for a source of parenting information that bypasses the formal health care sector.

One possible village resource that has yet to be tapped is the Health and Family Planning Commission (HFPC). The HFPC is the government agency historically responsible for the enforcement of China's one-child policy. As one of the largest bureaucracies in the world, a HFPC representative is permanently stationed in every single village across China. As China's economy grows and birth rates naturally decline, the government has been moving away from the one-child policy, and official sources have indicated that they expect an end to the policy sometime in the next few years. As a result, the HFPC is looking for a new institutional mission, and has turned its attention to early child development. The HFPC already has the institutional reach, the bureaucratic capability, and considerable experience doing village outreach and running informational campaigns. It may be the perfect candidate for taking on the challenge of educating caregivers on how to improve interactions with their children.

Whatever the source, it is especially critical that any informational campaign stress the importance that the first few years of life can have on a child's long-term development. Stressing this fact may help alleviate the role of time constraints in shaping caregiver behavior—if caregivers understand exactly how important good parenting

behaviors are, they may be more willing to prioritize engaging in such practices. In many developed countries, caregivers participate in childrearing activities and training that teaches them how to engage with their children in a way that will increase their children's cognitive abilities (Gutman and Feinstein, 2010; Bradley et al., 1989). If the gap in cognitive outcomes between developed and developing areas is to close, more programs must be established in China and in other developing contexts in order to provide parents and caregivers with this kind of parenting education.

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TABLE 1 Mental and psychomotor development of infants in rural Shaanxi based on the Bayley Scales of Infant Development (BSID) (N=1,442)

	Percent
Any mental impairment (MDI<80)	42.0% (606)
Any psychomotor impairment (PDI<80)	10.2% (147)

Note: Data source is author's data. Data are presented as percentages for all children. All children were administered the Bayley Scales of Infant Development (BSID), an internationally-recognized, scaled test of infant and toddler cognitive and motor development (Bayley, 1974). The test has two sub-indices, the Mental Development Index (MDI) and the Psychomotor Development Index (PDI) (Yi, 1995). MDI and PDI scores below 80 are indicators of any level of impairment in cognitive and psychomotor development, respectively.

TABLE 2 Association between household characteristics and parenting behavior.

	Read to child yesterday			Sing to child yesterday			Used toys to play with child yesterday		
	Coefficient	95% CI	p-value	Coefficient	95% CI	p-value	Coefficient	95% CI	p-value
Household receives Minimum Security payments	-0.01	(-0.06;0.04)	0.69	0.004	(-0.05;0.06)	0.90	-0.004	(-0.05;0.05)	0.88
Caregiver is mother	0.16	(0.11;0.22)	0.00	0.14	(0.07;0.20)	0.00	0.01	(-0.04;0.06)	0.70
Maternal educational level	0.13	(0.06;0.20)	0.00	0.15	(0.09;0.22)	0.00	0.04	(-0.02;0.09)	0.18

Note: Regression estimates from multiple linear models adjusted for gender, age, whether the child was born prematurely, whether the child is an only child, and mothers' age. Clustering is at the village level.

TABLE 3 Association between parenting behavior and child development as measured by Bayley Scales of Infant Development in rural Shaanxi (N=1,442)

	MDI score			PDI score		
	Coefficient	95% CI	p-value	Coefficient	95% CI	p-value
Read to child yesterday	7.04	(4.05; 10.03)	0.00	3.03	(-0.15; 6.20)	0.06
Sing to child yesterday	7.57	(-0.68; 3.49)	0.00	4.21	(1.99; 6.43)	0.00
Used toys to play with child yesterday	4.87	(2.65; 7.10)	0.00	2.74	(0.72; 4.77)	0.01

Note: Regression estimates from multiple linear models adjusted for gender, age, whether the child was born prematurely, whether the child is an only child, whether the child's mother was identified as the primary caregiver, maternal educational level and age, and whether the family received Minimum Living Standard Guarantee Payments. Clustering is at the village level.

FIGURE 1A Parenting attitudes of sample caregivers in rural Shaanxi (N=1,442)

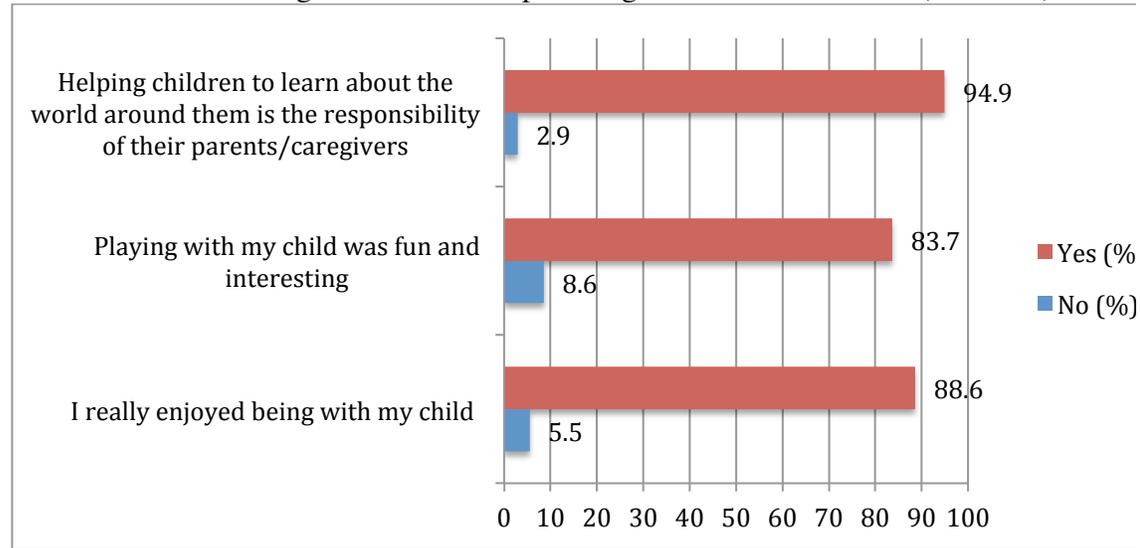
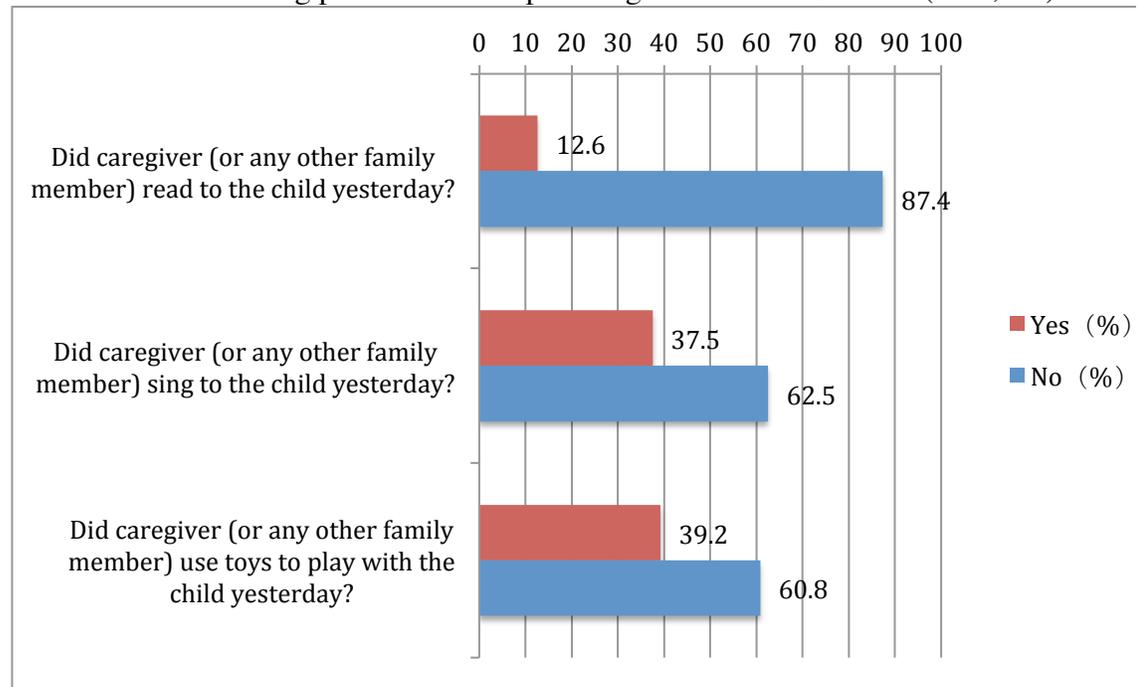


FIGURE 1B Parenting practices of sample caregivers in rural Shaanxi (N=1,442)



Note: Data source is author's data. Data are presented as percentages of caregiver responses.