Parental behavior and social-emotional development among infants in rural Shaanxi Province, China

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Abstract: The first years of life comprise a critical period for social-emotional development that has implications for lifelong outcomes. One factor that is thought to impact infant social-emotional development is parenting behavior and practices, such as reading to, singing to, and playing with their child. In this study we examine the situation of parenting practices and infant social-emotional development among a sample of 1,350 infants aged 18-30 months in rural Shaanxi Province, China. Our results show that few parents engage in positive parenting behaviors and social-emotional developmental delays are prevalent among our sample. Our multivariate analysis finds that this high prevalence of social-emotional delay is correlated with this lack of positive parenting behavior. Descriptive analysis suggests that the deficit of positive parenting behaviors may be related to a lack of reliable information on parenting. We suggest that the Chinese government take steps to improve access to information on parenting practices in order to improve the developmental outcomes of infants and young children in rural areas.

Keywords: parenting; social-emotional; infant development; rural China

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1. Introduction

The first years of life comprise a critical developmental period that has implications for lifelong outcomes (Almond & Currie, 2011). The pre-frontal section of the brain grows extremely rapidly in the first two years of life. This growth is crucial for the development of an individuals' social-emotional skills, such as emotional regulation, interpersonal relations, sensitivity, and empathy (Gerhardt, 2004). Researchers have found the development of social-emotional skills provide the foundation for participation society and improved quality of life (Cohen, 2006). Similarly, research has found that low levels of social development persist with age and may lead to negative outcomes later in life (Loeber, 1982; Huesmann et al., 2009). For example, family environment (including poor parenting practices) during the first 5 years of life has been found to be one of the most important predictors of antisocial behavior, such as aggression and future criminal activity (Moffit, 1993; Patterson et al., 1992; Loeber, 1982). With this understanding, it is likely that promoting social emotional development in early childhood improves an individual's likelihood of better outcomes in adulthood.

With evidence that this early development stage has important effects on lifelong outcomes, researchers have placed greater effort into identifying the underlying factors that may be associated with social-emotional development during this period. One factor that has been found to be significantly related to a child's emotional development is parenting behavior. The

literature base on social-emotional development during childhood has indicated that proper parenting behavior in infancy strongly influences children's positive developmental outcomes, which in turn serve to reduce future human-capital costs and costs to society (Baggett et al., 2010; Landry et al., 2001; Landry et al., 2006; Lyons-Ruth & Melnick, 2004; Smith et al., 2005). A number of studies have shown that parenting behavior and caregiver-child interactions are significantly linked with children's social-emotional development (Chang et al., 2009; Hong & Park, 2012; Anders et al., 2012; McElwain & Booth-LaForce, 2006; Bakermans-Kranenburg et al., 2003; Kochanska, 2001).

While previous research has made important contributions in demonstrating the importance of parenting behavior on child development, there are several gaps in the literature base. To date, almost all of the work investigating the social-emotional development of young children has been conducted in developed countries. Also, very few studies have examined children's social emotional development during infancy. Lastly, there are few large-scale empirical studies that seek to document the status of parenting behavior and how it is associated with a child's development. To our knowledge, no previous research has examined the correlation between parenting behavior and the social-emotional development of infants within a developing context, such as that of rural China.

In addition, evidence suggests that further research on the social-emotional development of children in rural China is warranted for several reasons. First, research has shown that the share of children with cognitive delays is higher in developing countries, including China

(Grantham-McGregor et al., 2007; Emerson et al., 2011). Given the high prevalence of cognitive delays among this group, it may be the case that social-emotional delays are also present. Additional research describing early parenting behavior might further our understanding of the state of social-emotional development among rural Chinese children and provide insights into what factors might be linked with social-emotional delays. Second, while several studies have shown that interventions to improve parenting behavior can be successful in developing settings (Attanasio et al., 2015; Grantham-McGregor et al., 2014), little is known about the situation of parenting. That is, it is unknown whether the attitudes, knowledge, or parenting practices of caregivers are in need of improvement. Research that illuminates these dimensions would be helpful in improving targeting and refining future intervention designs.

The goal of our paper is to provide an empirically-based overview of parenting in a developing country setting and to measure the correlation between parenting behavior and children's social-emotional development. To do so, we report on the findings of a large-scale survey of the parents or other caregivers (henceforth, *caregivers*) of 18 to 30 month old children in rural China. Specifically, we document the attitudes of caregivers towards their children and examine whether caregivers are willing to spend time engaging in activities that may help to improve their children's social-emotional development. Next, we describe the actual parenting environment of households in poor areas of rural China, as measured by rates of caregiver-child playing, reading, and singing behaviors. Finally, we measure the statistical correlations between parenting behavior and social-emotional development.

2. Study sample and Methods

2.1 Sample Selection

Our study was conducted in 2014 in 11 nationally designated poverty counties located in Shaanxi Province, China. The area is predominantly Han Chinese and had a per capita annual income of about 6,000 RMB in 2013 (Shaanxi Provincial Bureau of Statistics, 2014), which is lower than the 8,896 RMB national average for rural areas of the same year (National Bureau of Statistics, 2014). From each of these 11 counties, all townships (the middle level of administration between county and village) were selected to participate in the study. There were two exceptions to this rule: we excluded the one township in each county that housed the county seat, and we excluded any townships that did not have any villages with a population of 800 or more. In total, according to these criteria, 174 townships were included in the study.

The sample villages were originally selected in April 2013 as follows. To meet the power requirements of a larger, interventional study (not reported in this paper), we required a minimum of five children in each township. With this requirement in mind, we first randomly selected one village (with a population of 800 or more) from each township to participate. A list of all registered births over the past 12 months was obtained from the local family planning official in each village. All children in our desired age range were enrolled in the study. If a village had fewer than five children in our desired age range, we randomly selected an additional village in the same township for inclusion in the study, and continued to randomly select additional villages until five children per township had been found.

The data used in this study were collected from sample households over a four-week period in October, 2014. At this time, the sample children were aged 18-30 months. Overall, our study uses data from 1,350 households in 351 villages across 174 townships.

2.2 Data Collection

Teams of trained enumerators collected socioeconomic information from all households participating in the study. Each child's primary caregiver was identified and administered a detailed survey on parental and household characteristics, including each child's gender and birth order, maternal age and education, and whether the family was receiving Minimum Living Standard Guarantee Payments (a poverty indicator). The primary caregiver (typically either the child's mother or grandmother) was identified in each family as the individual who is most responsible for the child's care.

Our survey also included a series of questions about the parenting environment in the home. We asked two types of questions. First, we asked caregivers a series of questions about their relationship with their child and their attitudes toward their child. Next, we asked questions about how often caregivers exhibited different parenting behaviors. These included questions on how often caregivers show affection toward their child, play with their children child, read to their child, and sing to their child each day. Additionally, we also asked caregivers about the number of books in their home.

All children were also administered the Ages and Stages Questionnaires: Social-Emotional (ASQ:SE), an internationally-recognized, scaled test of infant and toddler

social-emotional development (Squires, Bricker, & Twombly, 2002). Studies using a large sample of children have tested the reliability and effectiveness of the test have found that in most situations ASQ:SE is capable of distinguishing between children who are and are not in need of improvement (Squires, Bricker, & Twombly, 2002; Squires, Bricker, & Twombly, 2004). The test has demonstrated high levels internal consistency and test-retest reliability (0.94), suggesting that test measures are stable over time (Squires, Bricker, & Twombly, 2002). Following the example of other published studies that use the ASQ:SE to assess infant development of social emotion in developed countries (Allen et al., 2010; Briggs et al., 2012; Brown et al., 2012), the test has been officially adapted into Chinese, and it was this version of the test that was used in this study.

All ASQ:SE enumerators attended a week-long training course on how to administer the questionnaire, including a 2.5-day experiential learning program in the field. The test was administered one-on-one in the household using a set of questionnaires. The ASQ:SE evaluates children's development of skills in terms of self-regulation, compliance, communication, adaptive functioning, autonomy, affect, and interaction with other people (Squires, Bricker, & Twombly, 2002). ASQ:SE scores are standardized to a mean of 0 according to the child's age and higher scores are indicative of social-emotional developmental issues. Within this study we used three forms of the ASQ:SE questionnaire, specifically those for children aged 15-20 months, 21-26 months, and 27-32 months. This study represents one of the largest administrations of the ASQ:SE ever conducted in China, and to our knowledge, the only

administration of the ASQ:SE ever conducted in rural communities in China's nationally-designated poverty counties.

3. Results

The basic socioeconomic and demographic characteristics of study participants are reported in Table 1. Of the 1,350 child in this study, slightly over half (52.4%) were male and 59.3% were only-children at the time of the study. The mother is the primary caregiver for 83.9% of the children in the sample, otherwise the grandmother is the primary caregiver. The majority of the mothers (84.0%) have completed fewer than 9 years of schooling and only 50.8% are over 25 years of age. About one-quarter (24.0%) of sampled families report receiving the Minimum Living Standard Guarantee Payments, a form of government welfare for the lowest income families nationwide.

3.1 Parenting attitudes and behaviors

Caregiver attitudes towards parenting are shown in Table 2. These findings suggest that the caregivers of infants generally have a positive attitude toward their child. Specifically, the data show that a large share of caregivers in the sample reported that they enjoy spending time or are willing to spend time with their children (88.4%). Almost all caregivers (90.8%) reported that they generally get along well with their child, and that they find playing with their children to be fun and interesting (83.9%). Only 10.2% of caregivers reported being irritated by their child over the past week and only 21.8% reported that spending time with their child was stressful.

Tellingly, nearly all (94.6%) of caregivers believed that it is their responsibility to help children to learn about the world around them.

Although our survey data indicate that caregivers care for their children, it also suggests that many caregivers do not know how to properly interact with their child. While caregivers are willing to spend time with their children and find playing with their children to be interesting, it is also the case that only 42.9% of caregivers self-reported that they "know how to relate to my child on his/her level." In addition, just half (50.4%) know how to read with their child. Some caregivers (15.7%) report not knowing how to play with their child at all. Though many rural caregivers wish to raise their children well, they may lack the knowledge on how to do so properly.

We then examined how often caregivers engaged in common parenting practices. In Table 3, we present data on the levels and types of interaction between caregivers and their children. When we asked how many times caregivers hugged or kissed or otherwise showed affection to their child over the past two days, 94.3% reported doing so at least once a day. However, we found that other forms of positive parenting practices were absent in many homes. We found that 87.1% of caregivers did not read to their children on the day prior to survey administration. This may be due to the fact that many households have few or no books; when we asked the number of books in their house, we found that 54.8% of households do not own any children's books, while an additional 36.5% of households have only between one and five

books in their home. Similarly, 62.3% of caregivers did not sing to their child and 60.5% of parents did not use toys to play with their child on the day prior to survey administration.

Deficiencies in proper parenting behavior may be due to a lack of sources of correct information on parenting practices. The survey also asked caregivers about the sources of their parenting knowledge and practices (Table 4). According to the findings, most caregivers (27.8%) obtained information about parenting practices from their own experiences. Many also obtained information from family members (44.4%) or friends (34.3%), who have essentially the same background as caregivers and therefore are not likely to have any better knowledge on parenting practices. We found that only 12.4% of caregivers in our sample received information about parenting practices from physicians, government personnel at the local family planning agency, or the official village-level representative of the National Women's Federation.

3.2 Links between parenting behavior and socioeconomic factors

Because proper parenting behavior is likely related to socioeconomic factors, we examined the bivariate associations between our observed parenting behaviors and selected child/household characteristics (Table 5). We find no difference in parenting behavior due to child's gender ($p=0.60$). Additionally, when the child's mother was identified as the primary caregiver, the rates of reading to, singing to, using toys to play with child were not significantly different than for other caregivers. However, when the maternal educational level was identified higher than 9 years, the rates of reading to, singing to, and using toys to play with the child were all significantly higher ($p<0.01$) than those exhibited by mothers with lower levels of schooling.

3.3 Social-emotional development

Next, we seek to investigate the state of social-emotional development and the prevalence of delays among our sample of rural children. ASQ:SE measures were available for all 1,350 children. The mean SE score for the sample was 11.2 and a total of 714 children (52.9%) had an SE score above 0, thereby classifying them as delayed in social-emotional development (Figure 1).

Additionally, when we examine rates of social-emotional developmental delay by the form of the questionnaire completed (that is, the questionnaires for children aged 15-20 months, 21-26 months, or 27-32 months), our results suggest that social-emotional delays become more prevalent as children age. We find that 44.9% of children who completed the questionnaire for 15-20 months of age displayed delays in social-emotional development, and this proportion increased to 46.9% of children who completed the 21-26 months of age questionnaire, and finally to 67.1% of infants who completed the 27-32 months of age questionnaire.

3.4 Links between parenting behavior and social emotion development

Next, we investigate whether there is a correlation between parenting practices and children's social-emotional development. Table 6 presents the bivariate associations between parenting behavior and child social-emotional development. We find that in households where caregivers reported reading to their children within the last day, ASQ:SE scores were significantly lower than in those of children in households where caregivers had not read to their children ($p<0.05$). Similar negative correlations were found between a child's ASQ:SE score and

having a caregiver sing to the child within the last day ($p<0.01$) and use toys to play with the child within the last day ($p<0.01$).

3.5 Multivariate analysis

In order to further examine the relationship between parenting behavior and the social-emotional development of infants, we run a series of multivariate regressions to obtain estimates of this correlation controlling for observable characteristics. The results of the multivariate analysis are consistent with the findings of the bivariate analysis (Table 7). We find that in households where the caregiver (or another member of the household) read to the child within the last day, the child's ASQ:SE score is 5.84 points lower ($p<0.05$) than that of children from households where caregivers had not read to the child (Row 1). We also find a significant negative correlation between singing to the child (-9.14 – Row 2) and using toys to play with the child (-5.39 – Row 3) and the child's ASQ:SE score ($p<0.01$).

4. Discussion

Parenting Environment in Rural China

In this paper we have shown the while caregivers care about their children and want raise their children properly, the actual parenting behaviors they practice are insufficient. According to our data, this inability to properly parent may lead to deficiencies in the social-emotional development of their children. In this study, we show that a high fraction of caregivers of 18-30 month old children living in low-income areas of rural China do not regularly engage in positive parenting practices, such as reading to, singing to, or using toys to

play with their children. Additionally, our research uncovers a high prevalence of social-emotional delays among infants in rural China that is correlated with parental behavior.

This discrepancy between caregivers' intents and their actual behavior draws into question what factors inhibit proper parenting practices that may aid a child's social-emotional development. Looking at caregiver attitudes towards engaging with their child, we see that nearly all (94.6%) caregivers believe that it is their responsibility to "help children to learn about the world around them," but only 42.9% reported that they "know how to relate to my child on his/her level," and only half (50.4%) know how to read with their child. Most of the caregivers we surveyed reported learning about parenting from their own experiences, from family members, or from friends. Only 12.4% of caregivers reported getting their information from more authoritative, government-sanctioned bodies/individuals. We therefore believe that poor parenting behaviors are not a result of caregiver indifference to their children. It is likely that caregivers in rural China lack reliable sources of information on how to care for and interact with their children.

One limitation of the study is its cross-sectional design, which does not allow us to identify causal relationships. Moreover, since our data on parenting environment is based on caregiver responses, we cannot rule out the possibility of recall bias. Another possible source of bias stems from the fact that our study children were identified based on a list of registered children provided by the village family planning official, thus systematically excluding all unregistered children. The number of unregistered children has drastically declined in recent

years, due to a combination of naturally declining fertility rates and loosening government policies, and therefore we believe this bias is negligible (National Bureau of Statistics, 2011).

5. Conclusions

Our study has several important implications. First, our data show that parenting behavior in rural China is likely deficient. Given the correlations we observe between each of the individual parenting factors and children's social-emotional development, these behaviors may be at least partly responsible for high rates of social-emotional delays among our sample. These high rates of social-emotional delays are concerning due to fact that low levels of social emotional development have found to be correlated with negative outcomes later in life. Therefore, if the government hopes to identify policies that can improve child development outcomes and decrease future social expenditure, one effective strategy may be to take steps to improve the ways in which parents interact with their children.

Our data further indicate that parenting behaviors, such as reading to, playing with, and singing to a child, are low in rural China. This suggests that during the time period in which vocabulary development has been shown to be crucial for a child's social-emotion development (Huttenlocher et al., 1991), rural Chinese caregivers rarely initiate parent-child interactions that can help develop their child's language acquisition. In many developed countries, caregivers of young children engage in parenting activities and even parenting training sessions that teach them how to engage with their children in such a way as to develop their children's

social-emotional competency (Bierman et al., 2008). China's rural areas may benefit from the adoption of a similar model of parental training and engagement.

Finally, our study underlines the stark lack of parenting information available to rural Chinese caregivers. Government sources of information are largely non-existent, and therefore most caregivers rely on their own experience or the experiences of others in their community to inform their parenting strategies. Future interventions should attempt to address this information gap. One potential strategy for filling this information gap is to employ the services of locally-based village doctors, family planning workers, and Women's Federation representatives to disseminate parenting information and training to village households. All of these representatives already draw a government salary, and are responsible for tasks that bring them into contact with local families.

References:

Allen, S.G., Berry, A.D., Brewster, J.A., Chalasani, R.K. and Mack, P.K. (2010), Enhancing Developmentally Oriented Primary Care: An Illinois Initiative to Increase Developmental Screening in Medical Homes. *Pediatrics*, 126(3), s160-s164.

Almond, D. & Currie, J. (2011). Human Capital Development Before Age Five. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics, Vol. 4* (pp. 1315-1486). Amsterdam: Elsevier.

Anders, Y., Rossbach, H.G., Weinert, S., Ebert, S., Kuger, S., Lehrl, S., & von Maurice, J. (2012). Home and preschool learning environments and their relations to the development of early numeracy skills. *Early Childhood Research Quarterly*, 27(2), 231-244.

Attanasio, O., Cattan, S., Fitzsimons, E., Meghir, C., & Rubio-Codina, M. (2015). Estimating the production function for human capital: Results from a randomized control trial in Colombia (Working Paper No. 20965). National Bureau of Economic Research.

Baggett, K.M., Davis, B., Feil, E.G., Sheeber, L.B., Landry, S.H., Carta, J.J., & Leve, C. (2010). Technologies for expanding the reach of evidence-based interventions: Preliminary results for promoting social-emotional development in early childhood. *Topics in Early Childhood Special Education*, 29(4): 226–238.

Bakermans-Kranenburg, M.J., van IJzendoorn, M.H., & Juffer, F. (2003). Less is more: Meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin*, 129(2), 195-215.

Beckwith, L., & Rodning, C. (1996). Dyadic processes between mothers and preterm infants: *Development at ages 2 to 5 years. Infant Mental Health Journal*, 17, 322–333.

Bierman K.L., Domitrovich, C.E., Nix, R.L., Gest, S.D., Welsh, J.A., Greenberg, M.T., Blair, C., Nelson, K.E., and Gill, S. (2008). Promoting Academic and Social-Emotional School Readiness: The Head Start REDI Program. *Child Development*, 79(6): 1802–1817.

Briggs, R.D., Stettler, E.M., Silver, E.J., Schrag, R.D.A., Nayak, M., Chinitz, S., and Racine, A.D. (2012). Social-Emotional Screening for Infants and Toddlers in Primary Care. *Pediatrics*, 129(2), e377-e384.

Brown, C.M., Copeland, K.A., Sucharew, H., Kahn, R.S. (2012). Social-Emotional Problems in Preschool-Aged Children: Opportunities for Prevention and Early Intervention. *Archives of Pediatric and Adolescent Medicine*, 166(10): 926–932.

Chang, M., Park, B., Singh, K., & Sung, Y.Y. (2009). Parental involvement, parenting behaviors, and children's cognitive development in low-income and minority families. *Journal of Research in Childhood Education*, 23(3), 309-324.

Cohen, J. (2006). Social, Emotional, Ethical, and Academic Education: Creating a Climate for Learning, Participation in Democracy, and Well-Being. *Harvard Educational Review*, 76(2), 201-237.

Emerson, E., Einfeld, S., & Stancliffe, R.J. (2011). Predictors of the persistence of conduct difficulties in children with cognitive delay. *Journal of Child Psychology and Psychiatry*, 52(11), 1184-1194.

Field, T., Guy, L., & Umbel, V. (1985). Infants' responses to mothers' imitative behaviors. *Infant Mental Health Journal*, 6, 40–44.

Gerhardt, S. (2004). *Why Love Matters: How Affection Shapes a Baby's Brain.* New York, NY: Routledge.

Grantham-McGregor, S., Cheung, Y. B., Cueto, S., Glewwe, P., Richter, L., Strupp, B., & International Child Development Steering Group, (2007). Developmental potential in the first 5 years for children in developing countries. *The Lancet*, 369(9555), 60-70.

Grantham-McGregor, S.M., Fernald, L.C., Kagawa, R., & Walker, S. (2014). Effects of integrated child development and nutrition interventions on child development and nutritional status. *Annals of the New York Academy of Sciences*, 1308(1), 11-32.

Hong, Y.R. & Park, J.S. (2012). Impact of attachment, temperament and parenting on human development. *Korean Journal of Pediatrics*, 55(12), 449-54.

Huesmann, L.R., Dubow, E.F., & Boxer, P. (2009). Continuity of Aggression from Childhood to Early Adulthood as a Predictor of Life Outcomes: Implications for the Adolescent-Limited and Life-Course-Persistent Models. *Aggressive Behavior*, 35(2), 136–149.

Huttenlocher, J., Haight, W., Bryk. A., Seltzer, M., and Lyons, T. (1991). Early vocabulary Growth: Relation to Language Input and Gender. *Developmental Psychology*, 27(2), 1236-248

Kochanska, G. (2001). Emotional Development in Children with Different Attachment Histories: The First Three Years. *Child Development*, 72(2), 474-490.

Landry, S.H., Smith, K.E., Swank, P.R., Assel, M.A., & Vellet, S. (2001). Does early responsive parenting have a special importance for children's development or is consistency across early childhood necessary? *Developmental Psychology*, 37(3), 387–403

Landry, S.H., Smith, K.E., and Swank, P.R. (2006). Responsive parenting: Establishing early foundations for social, communication, and independent problem-solving skills. *Developmental Psychology*, 42(4), 627–642.

Loeber, R. (1982). The Stability of Antisocial and Delinquent Child Behavior: A Review. *Child Development,* 53(6), 1431-1446.

Lyons-Ruth, K. & Melnick, S. (2004). Dose–response effect of mother–infant clinical home visiting on aggressive behavior problems in kindergarten. *Journal of the American Academy of Child and Adolescent Psychiatry*, 43(6), 699–707.

McElwain, N.L., & Booth-LaForce, C. (2006). Maternal sensitivity to infant distress and non-distress as predictors of infant–mother attachment security. *Journal of Family Psychology*, 20(2), 247–255.

Moffitt, T.E. (1993). Adolescence- limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100(4), 674-701.

National Bureau of Statistics (2011). *The Bulletin of 2010 Sixth National Census in China (No. 1)*. Retrieved from: http://www.gov.cn/test/2012-04/20/content_2118413.htm. [accessed on 5 February 2016]

National Bureau of Statistics (2014). *China Statistical Yearbook 2014*. Beijing: China Statistics Press.

Patterson, G.R. (1992). Developmental changes in antisocial behavior. In R.D. Peters, R.J. MacMahon & V.L. Quinsey (Eds.), *Aggression and Violence Throughout the Lifespan* (pp. 52-82). Newbury Park, CA: Sage

Shaanxi Provincial Bureau of Statistics (2014). *Shaanxi Statistical Yearbook 2014*. Beijing: China Statistics Press.

Smith, K.E., Landry, S.H., & Swank, P.R. (2005). The Influence of decreased parental resources on the efficacy of a responsive parenting intervention. *Journal of Consulting and Clinical Psychology*, 73(4), 711– 720.

Squires, J., Bricker, D., & Twombly, E. (2002). Ages and Stages Questionnaires: Social-Emotional (ASQ:SE): A parent completed, child-monitoring system for social-emotional behaviors. Baltimore: Paul H. Brookes.

Squires, J., Bricker, D., & Twombly, E. (2004). Parent-completed screening for social emotion problems in young children: Effects of risk/disability status and gender on performance. *Infant Mental Health*, 25(1), 62-73.

Table 1: Basic characteristics of sample children in rural Shaanxi Province (N =1,350)

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	708	52.4
Female	642	47.6
Only-child		
Yes	801	59.3
No	549	40.7
Mother is primary caregiver		
Yes	1133	83.9
No	217	16.1
Maternal educational level		
<=9 years	1134	84.0
>9 years	216	16.0
Maternal age		
Age<=25	664	49.2
Age>25	686	50.8
Families receive Minimum Living Standard Guarantee		
Yes	324	24.0
No	1026	76.0

Source: Authors' own data.

Table 2: Caregiver attitudes towards parenting in rural Shaanxi Province (N=1,350)

	Disagree (%)	Unsure (%)	Agree (%)
Thinking back over the last month, do you agree or disagree with the following statements:			
I really enjoyed being with my child.	5.6	6.0	88.4
Playing with my child was fun and interesting.	8.9	7.2	83.9
My child and I have gotten along very well.	4.2	5.0	90.8
I got irritated with my child.	76.2	13.6	10.2
The time I have spent with my child has been very stressful.	68.8	9.4	21.8
My child ignored me when I talked to him / her.	63.6	16.0	20.4
I didn't know how to relate to my child on his / her level.	42.9	18.8	38.3
In general, how much do you agree or disagree with the following statements:			
Helping children to learn about the world around them is the responsibility of their parents/caregivers.	3.1	2.3	94.6
I know how to read with my child.	33.2	16.4	50.4
I know how to play with my child.	15.7	15.1	69.2

Source: Authors' own data.

Table 3: Parental behavior of sample caregivers in rural Shaanxi Province (N=1,350)

Characteristics	Frequency (n)	Percent (%)
Over the past two days, about many times do you hug and kiss or otherwise show affection to your baby?		
0	77	5.7
1-5	496	36.7
6-10	526	39.0
Eleven or higher	251	18.6
How many children's books are in your house, including library books?		
0	740	54.8
1-5	493	36.5
6-10	75	5.6
Eleven or higher	42	3.1
Did caregiver (or any other family member) read to the child yesterday?		
Yes	174	12.9
No	1176	87.1
Did caregiver (or any other family member) sing to the child yesterday?		
Yes	509	37.7
No	841	62.3
Did caregiver (or any other family member) use toys to play with the child yesterday?		
Yes	533	39.5
No	817	60.5

Source: Authors' own data.

Table 4: Sources of information about parenting practices among sample caregivers in rural Shaanxi Province (N=1,350)

Information source	Frequency (n)	Percent (%)
Own experiences	375	27.8
Family members	600	44.4
Friends	463	34.3
Local doctor, local bureau of family planning, or Women's Federation representative	167	12.4
Books, TV, or Internet	645	47.8

Source: Authors' own data.

Table 5: The relationship between parenting behavior and child and household characteristics in rural Shaanxi Province (N=1,350)

	Did the caregiver (or any other family member) read to the child yesterday? (Yes=1; No=0)			Did the caregiver (or any other family member) sing to the child yesterday? (Yes=1; No=0)			Did the caregiver (or any other family member) use toys to play with the child yesterday? (Yes=1; No=0)		
Infant characteristics	Mean	CI (95%)	P-value	Mean	CI（95%）	P-value	Mean	CI (95%)	P-value
Gender									
Male	0.12	(0.10;0.15)	0.60	0.36	(0.32;0.40)	0.18	0.42	(0.38;0.45)	0.07
Female	0.13	(0.11;0.16)		0.40	(0.36;0.43)		0.37	(0.33;0.41)	
Only child?									
Yes	0.14	(0.12;0.17)	0.05	0.40	(0.37;0.43)	0.03	0.41	(0.38;0.44)	0.15
No	0.11	(0.08;0.13)		0.34	(0.30;0.38)		0.37	(0.33;0.41)	
Mother is primary caregiver									
Yes	0.13	(0.11;0.15)	0.99	0.38	(0.35;0.41)	0.30	0.40	(0.37;0.43)	0.31
No	0.13	(0.08;0.17)		0.35	(0.28;0.41)		0.36	(0.30;0.43)	
Maternal educational level									
≤ 9 years	0.12	(0.10;0.14)	0.00	0.34	(0.31;0.37)	0.00	0.37	(0.35;0.40)	0.00
> 9 years	0.19	(0.14;0.25)		0.56	(0.50;0.63)		0.50	(0.43;0.57)	
Maternal age									
≤ 25 years	0.13	(0.10;0.16)	0.95	0.38	(0.34;0.41)	0.97	0.40	(0.36;0.43)	0.99
>25 years	0.13	(0.10;0.15)		0.38	(0.34;0.41)		0.40	(0.36;0.43)	

Note: Regression estimates are from a logistic bivariate regression model. Data are presented as mean ± SD or % (n) for categorical variables. CI represents confidence interval

Source: Authors' own data.

Table 6: Social-emotional development of sample children in rural Shaanxi Province by parenting behavior (n=1,350)

	Social emotional development		
	N	Mean± SD	P value
Did the caregiver (or any other family member) read books to the child yesterday?			
Yes	174	5.6±34.8	<0.05
No	1176	12.0±35.8	
Did the caregiver (or any other family member) sing songs to the child yesterday?			
Yes	509	5.3±33.4	<0.01
No	841	14.8±36.3	
Did the caregiver (or any other family member) use toys to play with the child yesterday?			
Yes	533	7.7±35.5	<0.01
No	817	13.5±35.7	

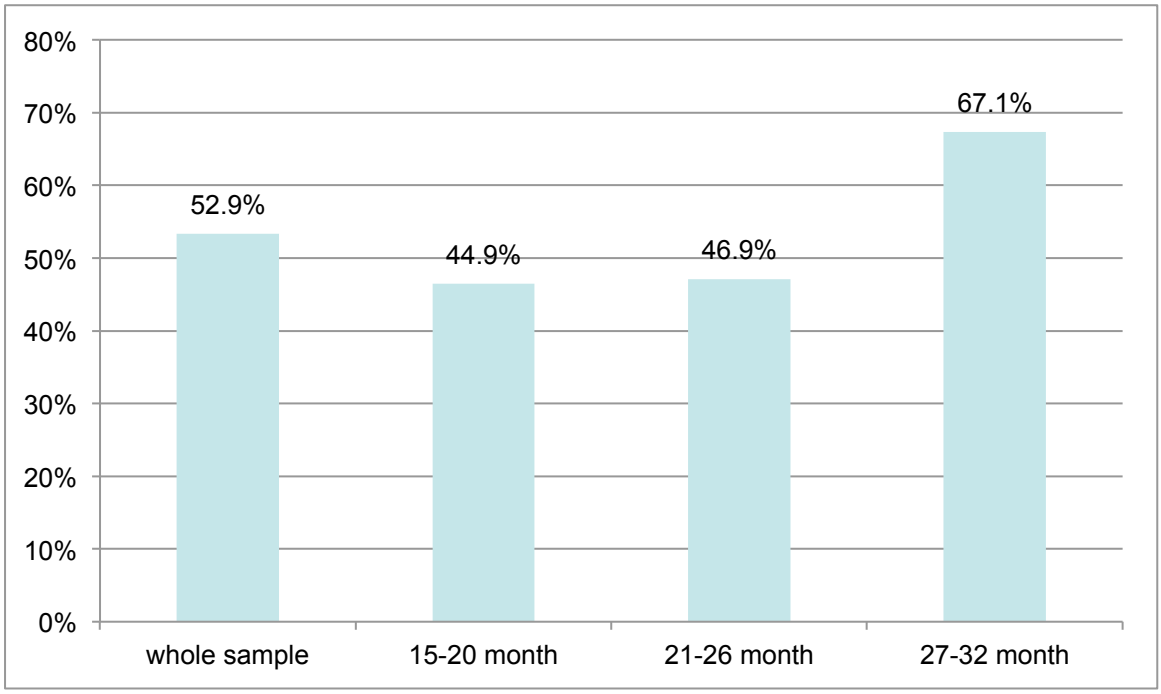
Note: Data are presented as mean ± SD or % (n) for categorical variables
Source: Authors' own data.

Table 7: Association between parenting behaviors and a child's social-emotional development in rural Shaanxi Province (N=1,350)

	Social emotional development		
	Coefficient	95% CI	p-value
[1] Read to child yesterday	-5.84	(-11.28;-0.40)	0.04
[2] Sang to child yesterday	-9.14	(-13.15;-5.14)	0.00
[3] Used toys to play with child yesterday	-5.39	(-8.85;-1.94)	0.00

Note: Regression estimates from multiple linear models adjusted for gender, whether the child is an only child, whether the child's mother was identified as the primary caregiver, maternal educational level and age, whether the family received Minimum Living Standard Guarantee Payments, the number of times caregivers showed affection to children within the past two days, the amount of screen time per day, and the number of minutes the child plays alone per day. Clustering is at the village level.
Source: Authors' own data.

Figure 1：Percentage of children suffering from social-emotional development delay in rural Shaanxi Province



Source: Authors' own data.