Behind before they begin: The challenge of early childhood education in rural China

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Abstract*:* The main goal of this paper is to analyze factors (accessibility, attendance rates and quality of preschools) that may be affecting the educational readiness of China's rural children before they enter the formal school system. Using data from a survey of 82 preschools and 492 households in six counties in three provinces of China, this paper documents the nature of early childhood education (ECE) services and the educational readiness of children aged four to five-years-old in rural China. We present evidence that ECE services are seriously deficient. We show that China's rural children score much lower on standardized tests of educational readiness than their urban counterparts and that more than one half of the rural children in our sample are "not ready" to continue on to the next level of formal education, possibly due to the poor quality of and low participation rates in early childhood education.

Keywords*;* early childhood education, educational readiness, rural China

Behind before they begin:
The challenge of early childhood education in rural China

By any metric, the performance gap between urban and rural students in China's education system is wide. According to a recent study, the matriculation rate to tier one or tier two colleges among students in large cities is about 54% (Wang, Liu, Zhang, Luo, Shi, Rozelle & Sharbono, 2011). In contrast, fewer than nine out of 100 students from the poorest rural areas in China achieve entry to a tier one or tier two college (Liu, Zhang, Luo & Rozelle, 2011). Gaps in educational performance, however, emerge even earlier: While more than 80% of students in large city school districts attend high school, fewer than 30% of those from poor rural areas do (Wang et al., 2011; Ministry of Education [MOE], 2006a).

The search for the reasons behind such low high school and college matriculation rates among poor rural students almost certainly needs to begin long before students and their families decide to leave the education system with only a junior high school diploma. One needs only to contrast the quality of the teachers or facilities to understand the deficits between rural and urban primary schools (World Bank, 2001; Wang et al., 2009). During the 1990s and early 2000s, per capita investment in the construction of facilities in urban areas was approximately four times greater than that in rural areas. Urban primary school students score far higher on standardized achievement tests than their rural counterparts (Ye & Gong, 2001).

It is even possible that at least part of the reason for rural students' poor educational performance can be found even earlier. Many educators—worldwide and in China—believe that a child's education needs to begin before she enters the formal education system (Heckman, 2000; Bowman, Donovan, & Burns, 2001; Grantham-McGregor, Cheung, Cueto, Glewwe, Richter, Strupp, & the International Child Development Steering Group, 2007). Evidence from a number of studies suggests that a child's educational readiness at the time she enters the formal school system (at age five or six) is an important indicator of how well the child will ultimately perform in school (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Schweinhart, 2007). A child's school readiness, while in part determined by the care received from family and

others before age six, is also affected by her schooling experience *before* primary school (hereafter, *early childhood education*, or ECE).

Despite the importance of this stage of a child's development, the literature in China is almost completely silent about the ECE experience in rural areas. In fact, since about two thirds of Chinese children still live in rural areas, improving ECE services in these areas is one of China's most pressing concerns. Although the Ministry of Education is officially responsible for promoting ECE in China, only a small number of ECE institutions are run by governmental departments and few of them are located in rural China. With only low levels of support from local governments, most ECE institutions in rural China suffer from unqualified teachers, poorly developed curricula and inadequate and poorly maintained facilities. Studies exist that describe the nature of China's ECE—in both urban areas and rural areas (World Bank, 1999; Liang, 2001; Wang, 2003; Yu, 2005; Bi, Zhang, & Ren, 2007; Zeng, Zhu, & Chen, 2007); however, most of this literature is purely descriptive and has little empirical rigor. Nowhere could we find a study comparing the readiness of rural and urban children at an age immediately before students begin their schooling. As a result, it is difficult to gain clarity about the participation of rural children in ECE programs and its effect on their educational readiness.

The purpose of the current study is to create a profile of the ECE experience in China's poor, rural regions. Specifically, we seek to address three questions: (1) What is the nature of ECE service delivery in China's poor rural areas, including factors such as student participation rates, student-teacher ratio, ECE teacher training, and overall quality of the facilities? (2) What is the overall level of educational readiness of rural children? (3) What is the impact of ECE participation on educational readiness?

Methods

Overview

The data used in this paper to document the nature of ECE services and the educational readiness of rural children were collected in a survey by the authors. The research team conducted the data collection work in the summer of 2008 in rural villages in six counties across three provinces (two counties per province): Gansu, Shaanxi and Henan.

County/township dataset (Dataset 1)

In collecting the county/township dataset, we surveyed all townships in 6 sample counties to gain a basic understanding of ECE in sample counties. All counties are nationally-designated poverty counties. A total of 97 townships were surveyed.

The county/township dataset came from two sources: (1) information provided by local township hospitals (children's vaccination records) and public security bureaus (PSBs); and (2) primary data on local ECE schools collected in collaboration with the county education bureau and their representatives in each township.

The main purpose of the dataset collected from the local township hospitals and PSBs was to produce a comprehensive list of children by age cohort. Using both lists we were able to categorize the children into lists by age group: three to three-and-a-half year olds; three-and-a-half to four-year-olds; four to four-and-a-half year olds; four-and-a-half to five-year-olds; five to five-and-a-half year olds; and five-and-a-half to six year olds. This information allowed us to create measures of participation in preschool and kindergarten and served as a sampling frame when we selected sample children that were not in preschool. In this paper *preschool* is defined as schooling before kindergarten that is voluntary and generally provided through the private sector. Students in preschool range in age from four to six. *Kindergartens* are schooling facilities for children, mostly aged six, in the year before primary school. Although kindergarten attendance is voluntary, kindergartens are primarily run by teachers/administrators in public elementary schools.

The second part of the county/township survey was carried out by working with education officials in the counties and townships to produce a list of preschools and kindergartens. This part of the survey had three blocks. The first block gathered information about the accessibility of ECE services for villages within each town. The second block identified the number of children by age cohort that were attending preschools and kindergartens. The final block enumerated the number of teachers in each ECE institution. The main purpose of this survey was to allow us to characterize access to preschool and kindergarten services and served as a sampling frame when selecting sample preschools.

Preschool and kindergarten dataset (Dataset 2)

With information we collected during the county/township survey, we were able to establish a preschool sampling frame for preschools (Dataset 2). We randomly selected 20 out of 77 townships across five sample counties. In the sixth county, in Henan province, we surveyed all 20 townships since it was to be the focus of a special sub-study during year two of the project. In total, then, 40 townships were selected to be part of our sample. Within these townships, we then randomly selected 82 preschools for inclusion in our study: 20 in Shaanxi province; seven in Gansu province and 55 in Henan province.

After the sample preschools were selected, the enumerators executed a detailed survey in each of the 82 sample preschools. The main purpose of the survey was to collect more detailed information from principals and teachers about the nature of ECE services in China's poor rural areas. The preschool questionnaires contained two main blocks. The first survey block asked about the staffing of preschools. For example, enumerators collected information on teachers' educational attainment, age, and experience teaching at the ECE level. The second survey block focused on the size of the facility, the quality of the building's construction material and furnishings (e.g. desks, blackboards) and whether or not the preschool had playground equipment, napping facilities, toilets, and the like.

Four-year-old children (and household) dataset (Dataset 3)

The third and final dataset was collected from a sample of four-year-olds in the study counties during a three-week period in June and July, 2008. The purpose of the survey was to measure the level of educational readiness of four-year-olds in poor rural areas. On average, we randomly selected 12 children in each sample town. Therefore, in the 40 sample townships the enumerators surveyed and tested 492 randomly-selected four-year-olds and their parents/guardians.

The interactions between enumerators and the four-year-old respondents (and their parents) consisted of two parts. First, enumerators collected information on basic household characteristics, including household size; parents' age, educational attainment and occupation; and the identity of the child's primary guardian. We also asked about the child's ECE experience. Next, the child was administered a test of educational readiness, described below in more detail.

In order to assess the educational readiness of the children in our sample, we adopted a testing instrument created by Dr. Mujie Ou (2007). For the past several decades, Ou, a child psychologist, has developed, tested, refined and benchmarked a test of educational readiness for children of different age groups. Based on her work, she was able to produce a definitive distribution of readiness scores for four to five-year-olds in urban areas. Built on the concept that educational readiness is a multidimensional concept, Ou's educational readiness test seeks to assess each child's cognitive ability, language skills, communication ability, independence, and fine and gross motor capacity. Each section of the test is scored in relation to the child's readiness relative to these six dimensions. The section scores are added to achieve a total score.

According to Ou (2007), most urban children have readiness test scores between 85 and 115. Using the results of past scores, Ou was able to produce a distribution of scores centered on 100 points (Ou, 2007; Hu, Xiao, & Xu, 2009). Although the tests are slightly different, the benchmark statistics of the distribution for each cohort—for example the four to four-and-a-half and the four-and-a-half to five year old age groups—are the same. Ou believes this distribution is representative of urban four to five-year-olds in urban China. Ou has also defined a cutoff of 70 points for determining a child's development relative to other children. In other words, if a child scores below 70 on the Ou Educational Readiness Test, the child can be deemed "not ready" for continuing on with his or her education. As seen from Ou's distribution, about three percent of urban children aged four to five years can be called "unready" (Figure 1, Panel A).

In this study we use the Ou test to measure the readiness of 492 rural four-year-olds. We have produced what we believe is the first set of scores and distribution of educational readiness for children from poor rural areas in China.

Results

ECE in poor areas of rural China: What the data say

According to the survey, relatively few families in rural China enroll their young children into formal childcare or early childhood education (ECE) programs. During our survey of ECE institutions we found almost no facilities for children under three years in formal care institutions. Specifically, none of the children under three years in the six sample counties were placed in preschools (Table 1, Columns 1 and 2).

Once children entered the four to six-year-old category, preschool and kindergarten attendance rises slightly, though it remains low. Only 15% of rural children aged four to six years in our sample counties were attending preschool (Table 1, Columns 3 and 4). Participation in kindergarten is slightly higher, though kindergarten is primarily attended by children who plan to enter elementary school (grade 1) the following year. In our sample, only 29% of children aged four to six years attended kindergarten (Column 5).

When considering the relationship between poverty and ECE, it is important to look at the behavior of sub-groups in addition to the overall averages. When looking across sample counties, the ECE participation rates in poorer counties are lower. For example, the poorest county in the sample, Zhangjiachuan has the lowest rate of ECE participation. In Zhangjiachuan only two percent of four to six-year-old children attend preschool and only nine percent attend kindergarten.

Since China's education system ultimately (in high school and college) has all students competing for the same number of positions in schools, it is perhaps most important to determine rural children's ECE participation compares to that of urban children. Comparing our survey data to findings of other researchers studying urban ECE in China, we find a large gap between urban and rural ECE participation rates (Sun, 2008). The total ECE participation rate in our sample counties is only 43%. In contrast, according to Sun (2008), the ECE participation rate in some of China's largest cities is over 90%.

Provision of ECE in poor rural China

Why is it that so few children from poor rural areas participate in ECE? According to our county/township survey data, access to ECE services, especially for

parents with preschool age children, may be one of the problems. Despite the large number of towns (97) and villages (1652) in our sample, there are only 180 preschools in the sample area, meaning that there are fewer than two preschools per town (Table 2, Columns 1 to 3). Each preschool is therefore providing ECE services for children in eight or nine villages, an unsurprising finding since only 11% of villages have preschool services in their own villages (Table 2, Column 4). The problem is even more severe in the poorest counties. In Zhangjiachuan (the poorest sample county), for instance, there are 15 townships and 269 villages, but only two preschools in the entire county.

Learning environment in ECE institutions

Our data demonstrate a low-quality learning environment in most preschools in our sample, both in terms of measured student-teacher ratios as well as along other dimensions such as teacher training and school facilities. While there are 96,209 children aged four to six years in our sample (and 42,585 that attend some type of ECE program), there are currently only 1492 teachers providing ECE services in the sample areas (Table 3). Of these 1492 ECE teachers, only 43% of them are in preschools; the rest (57%) are in kindergartens. Moreover, our interviews suggest that most kindergarten teachers only spend part of their time on ECE education. Instead, they spend most of their time teaching higher grades or working as administrative staff. On many days, these "kindergarten teachers" are only sporadically present in the classroom and provide minimal monitoring, let alone teaching.

With so few teachers, the attention that can be paid to each child will necessarily suffer. According to the county/township survey data (Dataset 1), in poor areas of rural China each ECE teacher is in charge of 29 children. This level is far above that of urban China (12:1—MOE, 2006a), and *both* urban and rural ratios are above the official national standard for ECE teaching. According to national regulations (MOE, 2006b), the ECE student-teacher ratio should not exceed 7:1. The 29:1 ratio in our sample exceeds this level several times over. Moreover, when dividing ECE into preschool and kindergarten, we find that the student-teacher ratio in kindergarten (33:1—not shown) is even worse than that of preschool.

Of the ECE teachers that do exist, few hold formal certification or have any formal training in preschool education or related fields. Of all of the ECE teachers in the

six sample counties, fewer than 12% majored in (or had any training in) ECE (Table 3, Column 3). In the case of kindergartens, the typical full-time teacher (as opposed to the part-time teachers discussed above) was most frequently a teacher who was nearing retirement. And while it is true that teachers nearing retirement and teachers without official qualifications from the education bureau typically do have experience teaching math or Chinese language, almost none of them have any background in ECE pedagogy. According to our survey, the number one concern of the preschool principals is that there is a serious shortage of teachers with any training in ECE teaching.

Our data also show that the shortcomings of ECE do not stop with teacher qualifications. Buildings are poorly constructed and equipment frequently falls short of meeting the developmental needs of students. Most generally, the locations of many preschools are far from ideal. During the preschool survey, enumerators had a chance to describe the environment surrounding the school on an open-ended portion of the questionnaire. An uncomfortable number of preschools are located beside unfenced fishponds and canals, alongside busy highways or adjacent to working factories or service centers. Safety was almost never cited as a reason for selection of the preschool site.

In addition, founders of preschools seldom have facilities that are dedicated to teaching preschool students. According to our survey, 34% of preschools are established in the homes of rural residents, most frequently the homes of the principals or the owners themselves (Table 4, Columns 1 and 2). Being homes built to service rural families, often built during the 1980s and 1990s, most houses and their yards are unsafe and unhealthy environments for preschool education in terms of physical structure, lighting and ventilation.

Inside the classroom, facilities are almost always under-resourced. Nearly half of the sample preschools did not provide children with desks and chairs that fit the needs of small children. Children 1.2 meters tall are asked to sit at desks that are 70 centimeters high and on chairs that are 40 centimeters high (Table 4, Column 5). This is an unhealthy and uncomfortable practice. Few of the preschools that our enumerators visited had specialized playrooms or equipment for activities, such as physical games, painting or music (Table 4, Column 6). Only 50% of the sample preschools had any specialized playground equipment or toys. Nearly zero had any equipment for undertaking basic

science projects. In addition, only 44% of sample preschools had resting or napping facilities (Table 4, Column 7).

Other services—in particular health and nutrition—were noticeably lacking. Only half of the preschools had a designated nurse, and only 15% of these full time nurses had received formal training. Fewer than 50% of the sample preschools provide any meals at all. And fewer than 10% of rural preschools were concerned with providing a balanced diet. Few meals in any of the preschools contained foods other than simple starches and, at most, a small quantity of vegetables. The kitchen facilities in many of the preschools that did exist were often dirty and unsanitary.

Whilst in a small number of respects the facilities of kindergartens are better (since kindergarten facilities are often inside the grounds of elementary schools), in many others they are worse. Almost none of the kindergartens had any specialised equipment for children. Principals often told us bluntly that investment into kindergarten facilities was one of the lowest priorities in already-stressed capital equipment/building budgets.

Financial barriers to participation in ECE

Another reason why parents—especially those in poor rural areas—may choose not to send their children to preschool and kindergarten is that they can be relatively expensive. While primary schools are now tuition free, preschools and kindergartens are not. Almost all the expenses of running ECE institutions are met by tuition and fees.

In fact, ECE tuition and fees can be so high that they may pose cash barriers for poor rural families. According to our data, the average yearly tuition is 380 yuan (50 USD), while yearly fees for in-school lunches are even higher, around 420 yuan (55 USD). Adding these costs together, we find that the yearly cost of ECE is a staggering 800 yuan (105 USD). Compare this with an average per capita income of just over 1000 yuan (130 USD) for Chinese families at the poverty line in 2007 (Wang & Wang, 2007). Considering these costs, it is easy to see why rural families—especially poor families — would choose to forego ECE.

Discussion: Why so little access, such poor quality and such high fees?

One of the reasons there is so little access to quality ECE services in China is that the government views preschool as a purely private activity. Although there are signs that this is changing, it is clear that the government still plays only a minor role in provision

of ECE services. According to the county/township survey, of all preschools in the six sample counties, only 18% are operated by the education departments of local governments.

Investment data from national sources also demonstrate the lack of commitment to ECE services, especially when compared to other categories of education spending (MOE & SSB, 2004). For example, in 2004 the government spent more than 180 billion yuan (21.8 billion USD) on college education. During the same year, total government expenditure on ECE was only eight billion yuan (less than one billion USD), less than four percent the amount spent on colleges. Overall, the annual percentage of government expenditure on ECE is only about one percent of the total annual expenditure on education. The gap between spending on the different levels of education is even larger when one considers the number of students that are affected. Whereas there are approximately 15 million students in college, there are more than 100 million children under six years and more than 20 million of these children attend preschool.

Educational readiness

With this institutional backdrop in mind, we turn now to the results of the educational readiness testing, which show that most children in rural China are already behind during their preschool years. The mean of the educational readiness test scores of rural four to five-year-olds was only 64—far below the tests scores of their urban counterparts (Figure 1, Panel B). Whilst about half of the urban children scored above the mean (100 points), only six percent of our rural sample children achieved scores of more than 100 points. This means that an urban child who achieves an average educational readiness score surpasses 94% of rural children.

The results of the Ou test also suggest that students from poor rural areas are not only behind in a relative sense, well over half of them are behind absolutely. While only about three percent of urban children scored less than the critical cutoff of 70 points (and could be called "not ready" for further education), fully 57% of rural children are not deemed "ready" to begin learning, according to Ou's criterion. If there is any truth to the idea that "once behind, always behind," certainly at least part of the urban-rural education gap starts during the preschool years.

Deconstructing rural "un-readiness"

Using the Ou framework, we can also identify which of the different dimensions poor rural students perform relatively higher (or lower) in. According to Ou (2007), if a child scores equal to or higher than the benchmark value, it means that he or she is "educationally well prepared". In the case of five of the six dimensions of educational readiness, rural children in our sample, on average, did not reach the benchmark values. This is true of both four to four-and-a-half year olds and four-and-a-half to five-year-olds. four to four-and-a-half year olds had the lowest cognitive scores. Among four-and-a-half to five-year-olds, language, communication and self-dependence scores are also low. Only in the case of gross motor ability (for both four to four-and-a-half year olds and four-and-a-half to five-year-olds) does the score of the average rural child exceed the benchmark readiness value.

Preschool attendance and educational readiness

With our current cross-sectional dataset we cannot statistically identify determinants of educational readiness, but our data will allow us to explore some of the major correlates (Figure 2). Using our data to descriptively examine the correlates of educational readiness, we see that the average ECE attendee achieved a score that showed she was ready to continue with her education (the mean was 71 points). In contrast, four to four-and-a-half year olds who did not attend ECE scored an average of only 58 points. Similar patterns are found for four-and-a-half to five-year-olds: Those who attended preschool scored higher than those who did not (65 versus 51 points). Importantly, when looking at children who did not attend ECE, a full 64% of four to four-and-a-half year olds and 83% of four-and-a-half to five-year-olds did not achieve the 70 point cutoff.

We also examine this question with multivariate analysis. In general, the educational readiness of a child is determined not only by his or her preschool attendance (if any), but also by other characteristics of the child and the child's family (Armecin, Behrman, Duazo, Ghuman, Gultiano, King, & Lee, 2006; Aboud, 2006). Following the literature, the relationship we hope to measure can be summarized as:

(1) $Y = \beta_0 + \beta_1 * X + \beta * Z + \varepsilon$,

where Y is the educational readiness of each sample child; X is a dummy variable equal to one if the child participated in ECE; and Z is a matrix of other observed factors that

affect educational readiness, such as parental age, occupation, and educational attainment. The symbol, ε, is an error term with mean zero that is assumed to be normally distributed.

Even when controlling for other factors in a multivariate regression framework, we find a significant positive correlation between preschool attendance and educational readiness scores. On average, a child who attends preschool scores 12 points higher on the Ou educational readiness test than a child who does not attend preschool (Table 5, Columns 1 and 2). Given that the mean educational readiness test score for a rural child is only 64 points, our results indicate that children who attend preschool have an educational readiness test score that is 20% higher (0.6 standard deviations) than those who do not attend.

Conclusions

Despite the fact that China has made impressive strides in education over the past several decades (and even more so in recent years), the results reported here show that ECE in rural areas is still plagued by many problems. Many families and villages have limited access to quality ECE services. There are even fewer services for children under 3. Teachers are poorly trained and facilities do not meet minimum standards.

At the same time, ECE services in rural China are relatively expensive, especially for families in poor areas. This no doubt further discourages participation. Most ECE facilities are private. The government plays only a secondary role in the provision of ECE services, and the per capita investment is only a fraction of that being invested into higher levels of education. As a result, rural ECE institutions collect tuition and fees from parents equal to almost one full year of the per capita income of a family at the poverty line. Many poor families appear to be unable to send their children to preschools or kindergartens due to these liquidity constraints.

Under these conditions, China's rural children appear to have fallen far behind their urban peers in physical, cognitive and social development. According to our analysis, more than half of children in poor rural areas of China are not ready for the next stage of their education. There is also evidence that children’s educational readiness test scores in rural China worsen as they move closer to school entry. As a result, rural children are entering school at a disadvantage. It is possible that this initial disadvantage will continue to hamper their learning experience throughout life.

Although there undoubtedly are other factors that impact the gap in educational readiness between rural and urban children before primary school, this paper shows that educational readiness scores are higher among children who participate in ECE. If this relationship is causal, improving accessibility to and quality of ECE services may be a first step in helping to close the urban-rural education gap.

While parents certainly bear some responsibility for their children's education, financial constraints and the high cost of access mean it is often difficult for families to send their children to ECE schools. Our results show that ECE is correlated with better academic outcomes, making it imperative that the government become actively involved in the delivery of ECE. There are many opportunities to do so: vouchers for the families of poor children and direct and indirect support of preschools are just two options that have been tested in recent years (Currie & Thomas, 1995; Garces, Thomas & Currie, 2002). The main goal of this policy effort should be to enable greater numbers of rural children to enjoy access to higher quality ECE.

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Table 1
Preschool and kindergarten participation rates in rural China, 2008.

Province (County)	Total number of children aged 0-3 years	Percentage of children aged 0-3 years that attend preschool (%)	Total number of children aged 4-6 years	Percentage of children aged 4-6 years who attend preschool (%)	Percentage of children aged 4-6 years who attend kindergarten (%)
Shaanxi (Baihe)	3774	0	3601	32	13
Shaanxi (Changwu)	8584	0	7553	39	5
Gansu (Kongdong)	10001	0	11336	8	22
Gansu (Zhangjiachuan)	12496	0	13248	2	9
Henan (Lushan)	29826	0	26539	24	19
Henan (Shangcheng)	32125	0	33932	7	56
Total	96806	0	96209	15	29

Data source: Authors' county/township dataset (Dataset 1).

Table 2
Availability of ECE services in sample villages, 2008.

Province (County)	Number of townships	Number of villages	Number of preschools	Percentage of villages with preschools (%)
Shaanxi (Baihe)	14	113	19	17
Shaanxi (Changwu)	11	187	57	30
Gansu (Kongdong)	18	245	17	7
Gansu (Zhangjiachuan)	15	269	2	1
Henan (Lushan)	20	507	64	13
Henan (Shangcheng)	19	331	21	6
Total	97	1652	180	11

Data source: Authors' county/township dataset (Dataset 1).

Table 3
Characteristics of teachers engaged in ECE services in rural China, 2008.

Province (County)	Number of teachers engaged in ECE	Percentage of ECE teachers in preschools (%)	Percentage of ECE teachers that majored in ECE (%)	Percentage of ECE teachers with special ECE training (%)
Shaanxi (Baihe)	80	85	14	56
Shaanxi (Changwu)	148	92	22	39
Gansu (Kongdong)	160	26	23	55
Gansu (Zhangjiachuan)	57	25	2	9
Henan (Lushan)	531	60	15	20
Henan (Shangcheng)	528	12	5	18
Total	1492	43	12	27

Data source: Authors' county/township dataset (Dataset 1).

Table 4
Nature of the facilities in sample preschools

Province (County)	Number of sample preschools	Percentage of family-operated preschools (%)	Outdoor play space (per capita square meters)	Area occupied by buildings (per capita square meters)	Percentage of preschools with child-friendly desks/stools (%)	Percentage of preschools with playrooms (%)	Percentage of preschools with dorms (%)
Shaanxi (Baihe)	8	75	1.1	3.6	38	0	75
Shaanxi (Changwu)	12	42	0.9	5	67	25	8
Gansu (Kongdong)	5	20	0.9	2.1	80	0	60
Gansu (Zhangjiachuan)	2	50	0	1.7	50	50	0
Henan (Lushan)	42	36	0.6	2.7	26	10	60
Henan (Shangcheng)	13	0	0.9	1.2	54	8	8
Total (mean)	82	34	0.7	2.7	41	11	44

Data source: Authors' preschool dataset (Dataset 2).

Table 5
Regression analysis examining the relationship between ECE and educational readiness in rural China, 2008.

	Educational readiness test score (OLS)	Educational readiness test score (OLS)
Participates in ECE or not (0=no; 1=yes)	13.5	12.8
	(5.85)***	(5.45)***
Gender (0=female; 1=male)	-0.001	-0.10
	(-0.00)	(-0.05)
Age group (0=4-4.5 years; 1=4.5-5 years)	-6.93	-6.63
	(-3.36)***	(-3.16)***
Value of family house (yuan)	1.73	1.47
	(1.83)*	(1.51)
Mother's age (years)	-0.06	-0.01
	(-0.33)	(-0.03)
Mother's educational attainment (years)	3.85	3.35
	(2.90)***	(2.19)**
Mother's health status (0 = not in good health;1 = in good health)	0.48	0.71
	(0.23)	(0.31)
Mother's off-farm employment status (0=no; 1=yes)	0.35	0.07
	(0.21)	(0.04)
Father's age (years)		-0.07
		(-0.22)
Father's educational attainment (years)		1.01
		(0.62)
Father's health status (0 = not in good health; 1 = in good health)		-0.96
		(-0.37)
Father's off-farm employment status (0=no; 1=yes)		-0.74
		(-0.31)
Constant	46.84	49.95
	(5.49)***	(5.05)***
Observations	454	454
R-squared	0.13	0.12

Notes: T statistics in parentheses, and *** means p<0.01; ** means p<0.05; * means p<0.1.
Data sources: Authors' four year old children survey (Dataset 3).

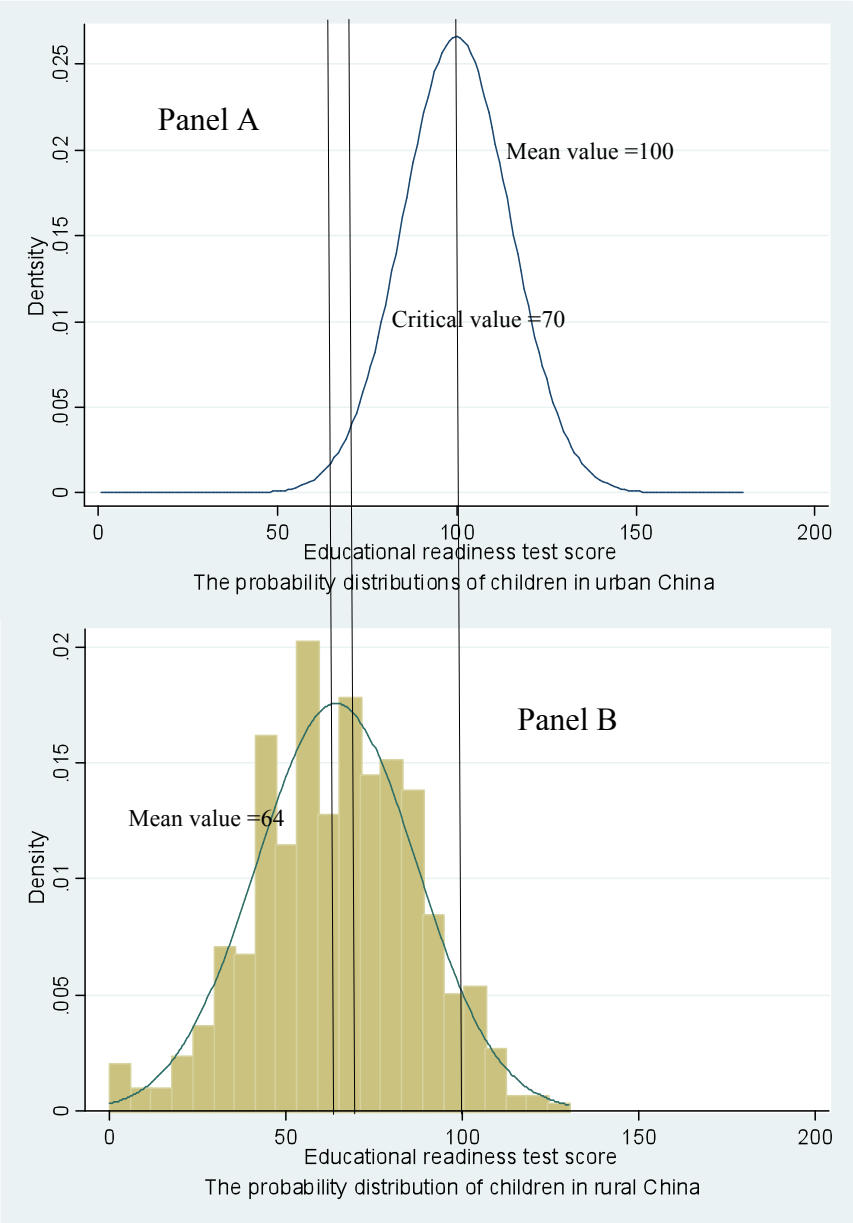

Figure 1. Distribution of educational readiness test scores for children age 4-5 between urban and rural China

Data sources: Data used in Panel A are from Ou, 2007. Data used in Panel B are from the authors' four year old children survey (Dataset 3).

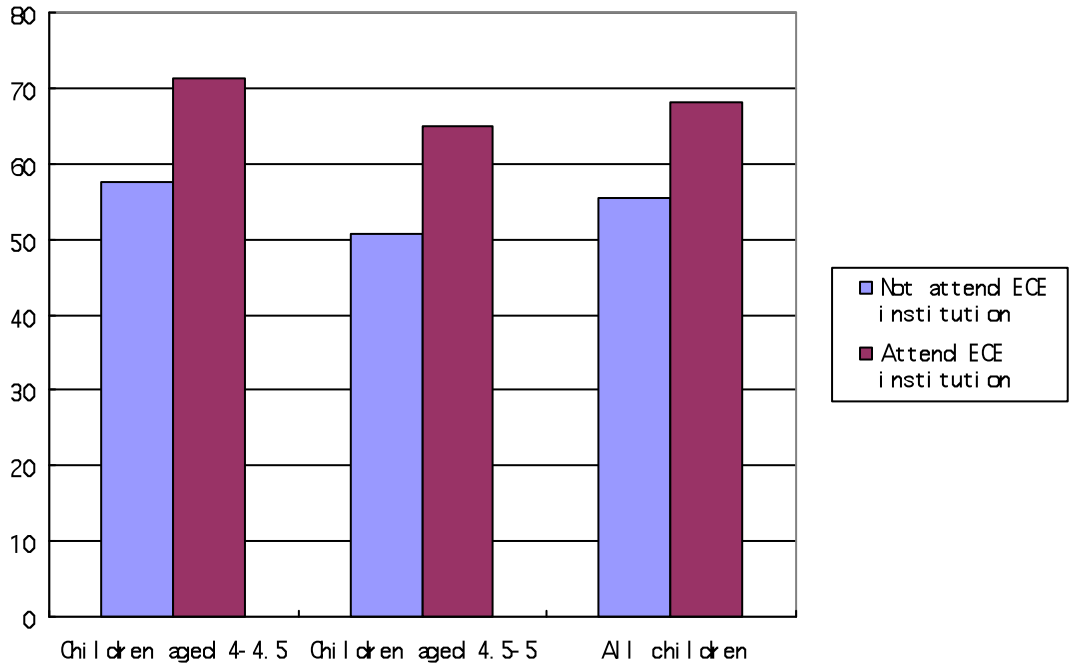

Figure 2. The differences between educational readiness scores between children attending preschool and children not attending preschool.

Data source: Four year old child survey (Dataset 3).