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The effects of preschool attendance on adolescent outcomes in rural China

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ABSTRACT

Despite growing public attention to access to preschool education in rural China, there is limited evidence about its potential long-term impacts on child development. Using a nationally representative dataset from China Family Panel Studies, this paper is the first rigorously estimating the long-term effects of preschool attendance on multiple domains of child development in rural China for a sample of 11–15 year olds. Results based on ordinary least squares analysis, county fixed effects, and propensity score matching point to a consistent positive association between preschool attendance and individual social skills, although no association was found between attendance and cognitive skills. Directions for future research and policy recommendations related to early education development in China are discussed.

1. Introduction

Over the past three decades, the number of programs and enrollment in formal preschool education has been growing in China. This rise in the prominence of preschool education has accompanied rapid economic growth and an increasing emphasis on child cognitive and noncognitive development. According to the China National Statistical Bureau (2011), the raw preschool attendance rate (for ages 3–6 before entering the first grade) increased from 11% in 1978 to 57% in 2010; that rate had reached 68% by the end of 2013, with about 39 million children enrolled in preschools (China News, 2014). In addition to the multiple potential benefits of formal childhood education on child development documented in the existing literature worldwide (e.g., Barnett, 2008; Camilli, Vargas, Ryan, & Barnett, 2010; Currie, 2001; Heckman, 2006; Nores & Barnett, 2010; UNESCO, 2010), parents in China have begun to look to preschool to cultivate children's social skills as well as their cognitive development. The attention to social skills is particularly important given China's one-child policy, and preschools may be "correcting the tendency of parents and grandparents to spoil single children" (Tobin, Hsueh, & Karasawa, 2009, p. 37). With more than 82 million children under age 5 living in China (UNICEF, 2013), early child care and education is not only an important issue for families in China, but also an area for public policy action. Indeed, when the China Central Committee elicited opinions from the public to draft the *2010–2020 Medium and Long-term Education Development and Reform Outline*, 25% of the proposals were related to preschool education (Zeng, Fan, & Zhou, 2011).

Preschool attendance in rural areas of China is of particular public policy importance. Recent research indicates that the preschool attendance rate in rural areas is much lower than in urban areas. For example, the 2006 attendance rate for rural and urban areas based on data from nine provinces was 21% and 46%, respectively (Gong, Xu, & Han, 2015). Considering that 60% of children under age 6 in China live in rural areas (authors' calculation using data from 2010 Chinese Population and Employment Yearbook for the year 2009), the issue of preschool attendance in rural China warrants public attention (China National Statistics Bureau, 2010).

Rural China also faces a widespread dearth of educational resources, and prior research has shown great disparities in development and academic achievement between rural and urban areas across the country (UNICEF, 2010; Xiao, 2006). Rural children have been found to lag behind children in urban areas in various cognitive and noncognitive measures as well as in academic performance. For example, studies reported that the average educational readiness test scores of rural 4- to 5-year-olds was only 64 points in 2008 (only 6% of the rural sample children achieved scores of more than 100 points), whereas about half of the urban children scored above 100 points, on a scale of 0–200 (Luo et al., 2012).

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The gap has been found to persist into higher grades, although few empirical studies have looked at long-term outcomes (Li et al., 2014; Peng, 2014; Wang, 2011; Zhao, 2011). Thus, understanding the potential impacts of preschool attendance on rural children is of particular policy interest. Given the documented benefits of early childhood education on later academic and social achievements (Heckman, 2006), many researchers and policy makers have advocated the expansion of preschool enrollment in rural areas as an important strategy for narrowing the academic achievement gap between rural and urban children (China Economic Times, 2015; Wu, Young, & Cai, 2012).

Despite great public interest in early childhood education in general and in rural China in particular, evidence of the effects of preschool attendance on child development and later outcomes in China is relatively scarce. Only a few studies have examined the short-term effects of preschool attendance on child development in China (Liu et al., 2013; Luo et al., 2012; Peng, 2011; Rao, Sun, Zhou, & Zhang, 2012; Wu et al., 2012; Zhang, 2013). Although all of these included rural samples, none examined long-term outcomes beyond age 10 (as defined in Camilli et al., 2010). Given the widely documented "fade-out" phenomenon whereby the effects of early childhood education programs on cognitive skills (e.g., test scores) disappear within a few years or become attenuated over time, evidence about whether the positive impacts of preschool attendance on rural children, if any, persist as they enter adolescence is vital.

Building upon a large set of literature documenting the positive effects of preschool attendance on child development in the United States, this paper examines whether preschool attendance is positively associated with children's long-term development in rural China. If so, are the effects more pronounced for certain developmental domains (i.e., cognitive vs. noncognitive skills)? Using data from the China Family Panel Studies (CFPS), a national representative dataset that follows a sample of about 16,000 households in 25 provinces of China since 2010, we focus on the long-term effects of preschool attendance on adolescents' attention, social, and cognitive skills for a sample of about 1795 11–15 year olds who attended preschools in the late 1990s. These outcomes play important roles in individual labor market prospects and well-being later in life (Almlund, Duckworth, Heckman, & Kautz, 2011; Duncan & Dunifon, 2012; Levin, 2013).

Our study is the first to rigorously examine the long-term effects of preschool attendance on multiple domains of child development in rural China using multiple empirical strategies, including multilevel propensity score matching. Our findings not only shed light on our understanding of the role of preschool for children in rural China but also have important policy implications for resource allocation and preschool education reform in China.

1.1. Preschool in rural China

In this paper, we use the term "preschool" to refer to all early childhood education (ECE) programs in rural China, in line with recent studies (e.g., Luo et al., 2012; Rao et al., 2012). Two major types of ECE programs have been provided in rural China since the 1980s: *you er yuan* and *xue qian ban* (Tang, 2005). Both are formal center-based programs, and each accounts for approximately half of the preschool enrollment in rural China (Zeng et al., 2011; for more information on the types of programs, please see Rao et al., 2012 and Tang, 2005).

You er yuan, often translated as "kindergarten" in English (Rao et al., 2012), usually provides three years of education before formal schooling (which begins in first grade in China). Most *you er yuan* programs accept children starting at age 3, although some have recently started accepting younger children due to parental demand. Some surveys, such as the CFPS used in this study, include in the definition of *you er yuan* another type of ECE called *tuo er suo,* which often serves 50 or fewer children as well as children younger than age 3. *Xue qian ban,* sometimes translated in English as "preprimary class," is a one-year preprimary program for literacy and numeracy preparation before children enter first grade (Gong et al., 2015; Rao et al., 2012).

Below, we briefly introduce three key aspects of preschool education in rural China: access, funding, and quality. Here we follow the Chinese government's official definition of "rural" as counties, townships, and rural village areas (for details, please see Kamal-Chaoui, Leman, & Rufei, 2009). Overall, it is widely acknowledged that preschool education in rural China suffers from lack of access and funding, coupled with subpar quality of education and services that lag substantially behind those provided in urban areas (China Economic Times, 2015; Pang, 2009; Wu et al., 2012; Zeng et al., 2011). It is yet to be seen whether the full implementation of the "*2010–2020 Medium and Long-term Education Development and Reform Outline*" announced by the Central Government of China will improve access to, funding for, and the quality of preschool programs in China.

1.1.1. Access and funding

In the late 1990s and early 2000s, families chose to use childcare services and send their children to preschools for two primary reasons: (1) to facilitate maternal work outside of the home and (2) to improve their children's school readiness and academic performance. More and more parents have been looking to preschool for the latter reason in recent years (Zeng et al., 2011). According to the Chinese Ministry of Education, there were 71,588 preschools in rural China in 2010, with an overall enrollment of 13.85 million children aged 3–6. Yet, this number accounts for far less than half of rural children between three and six years of age, translating into a very low preschool attendance rate (15% in 1991 and 21% in 2006, Gong et al., 2015). Limited public funding for ECE in rural China may partially explain this low attendance rate. China has a decentralized public financing system for education, so ECE funding largely depends on the fiscal capacity of the county, township, or even the village. In the late 1990s and early 2000s, when our sample of adolescents attended preschools, many preschools in rural China were funded by the village community. Consequently, poor rural counties tend to have a much lower per-child public preschool expenditure and fewer preschools compared to resource-rich areas. In addition, since the early 1990s, China has shifted to a market model for preschool education. As a result, more private kindergartens have been established, and most ECE programs in rural areas, whether public or private, charge fees. One study focused on a rural county in Sichuan province found that 54% of the cost of preschool education was paid out of pocket (Ma & Peng, 2012). These expenses impose a relatively heavy burden on rural families, who often have lower incomes than households in urban areas. Moreover, rural residents, already resource-constrained, also lack government welfare subsidies that are designated primarily for public-sector employees (Zeng, 2006). As a result, many rural households opt not to send their children to preschool.

1.1.2. Quality

In addition to limited access to preschools, the overall quality of rural preschools is low, particularly in terms of teacher qualifications and curriculum (Zeng et al., 2011). The quality of rural preschools in the late 1990s was even lower, with private providers offering the poorest care (Huo, 1997). A typical teacher in a rural preschool has only a high school education (Peng, 2011). Therefore, they tend to be insufficiently trained and also receive low compensation (Peng, 2011; Zeng et al., 2011). Some preschools may have appropriate educational materials, but such facilities are almost exclusively located in large towns while the majority of preschools