

Does Preschool Education Experience Help Disadvantaged Students Become Academically Resilient? Empirical Evidence from CEPS Data

Zhenyi Li, Wanpeng Lei

College of Education, Central China Normal University, Wuhan 430079, China

Abstract: Supporting socio-economically disadvantaged students to improve their academic resilience is vital in promoting social mobility and halting intergenerational transmission of poverty. Based on the baseline data 2013-2014 from the China Education Panel Survey (CEPS) database, this paper examined the impact of preschool education experience on academic resilience of disadvantaged students using coarsened exact matching (CEM) and hierarchical logistic regression. Research findings show that disadvantaged children have less access to preschool education than their advantaged peers, with a kindergarten attendance rate lower than 70%; that preschool education can significantly improve children's cognitive ability and effectively predict academic resilience of disadvantaged students; and that preschool education is a better predictor of resilience of rural disadvantaged students than that of their urban counterparts. The government should reinforce subsidies for early childhood education that can serve as compensation for disadvantaged kids; and should further universalize preschool education to secure the opportunity of high-quality pre-primary school education for disadvantaged children.

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Correspondence to: Wanpeng Lei, College of Education, Central China Normal University, Wuhan 430079, China.
E-mail: 2466691134@qq.com

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Raising the Questions

Preschool education plays a compensatory role in promoting the development of disadvantaged students, making up for the deficiency of home education due to the low education level of parents (Britto, Yoshikawa, & Boller, 2011). From the global perspective, numerous countries have formulated support policies to boost preschool education to close the gaps between children from different family backgrounds (Pang & Xia, 2013). Existing empirical research demonstrated that early childhood growth has enduring effects on individuals' lifelong development (Darmstadt et al., 2019). Heckman and Raut (2016) discovered in their study that investment in preschool education can bolster children's cognitive and non-cognitive abilities and that educational subsidies for disadvantaged students can improve economic mobility of low-income families and help terminate intergenerational transmission of poverty in them. From a long-term standpoint, investment in pre-school education is one of the most cost-effective strategies that improve the productivity and heighten the competitiveness of the nation by intervening in the intergenerational transmission of poverty.

Utilizing the baseline data of the China Education Panel Survey (CEPS), this article aims to address the following questions: What is the status quo of preschool education among disadvantaged children? Is preschool education beneficial to the cognitive development of disadvantaged children? Are there group differences in the effects of preschool education experience on academic resilience between urban and rural students? Coarsened exact matching (CEM) and hierarchical logistic regression were adopted in the analysis.

The Research Design

The Source of Data

This study sourced data from the baseline investigation of CEPS in the academic year 2013-2014, which was designed and conducted by the National Survey Research Center at Renmin University of China. Adopting probability-proportional-to-size sampling, it surveyed the seventh and ninth grade students and their parents, teachers, and principals by questionnaires to collect information about students' preschool attendance, family backgrounds, cognitive capabilities and more. The baseline survey included approximately 20,000 students from 438 classes of 112 schools in 28 counties (or city districts) in China.

The Selection of Variables

The Dependent Variable

The dependent variable in the study is "the resilient student" (1 = being resilient student, 0 = being non-resilient student). OECD defines resilient students as those who fall in both the bottom third of their country's socio-economic background distribution and the top third of their country's performance distribution on the PISA science assessment

scale (OECD, 2011). The operational definition of resilient students in this study is “students who fall in both the bottom fourth of China’s socio-economic background distribution and the top fourth of China’s performance distribution on cognitive ability assessment scale. Data shows that there are 4710 disadvantaged students in the sample and resilient students account for 12.17% of them.

The present study measured the subject’s family social and economic status (SES) by parents’ highest education level, highest occupational status, self-reported household economic circumstances, and the size of home book collection. A continuous variable (KMO=0.695) was obtained via a principal component analysis and was further converted into an SES index variable with a range of 1-100. According to this index, those students whose family SES falls in the bottom fourth of China’s socio-economic background distribution are defined as disadvantaged students. The index was also a criterion for identifying resilient students.

The Explanatory Variable

The core explanatory variable in this study is “having received preschool education or not” (Yes = 1, No = 0). The question “Have you attended any kindergartens or pre-primary classes before the age of three?” was included in the CEPS’s questionnaire.

According to the SES index, the subjects are divided into three groups: the disadvantaged, ordinary, and advantaged groups. Data shows that the percentages of students who had preschool education experience among the three groups are 68.03%, 81.59%, and 89.10%, respectively, with significant gaps ($X^2=675$, $p=0.000$). For urban and rural groups, the proportions of students with preschool education experience are 84.94% and 75.71%, respectively, indicating a considerable difference ($X^2=254$, $p=0.000$).

The Control Variables

This study has controlled individual-, family-, and school-related variables that may pose impact on individual preschool attendance and cognitive ability. Individual-related control variables include gender, grade, type of Hukou (registered permanent residence), and being the only child in the family or not. Family-related control variables include family economic circumstances before the student’s primary school attendance and the average number of years of schooling in the local county or city district where the student lives. The school-related control variable is the location of the school (rural school= 1, urban school= 0).

Research Methods

- Coarsened Exact Matching (CEM)
CEM established by Iacus, King, and Porro (2012) was determined as an effective approach to define the net impact of preschool education experience on cognitive ability of disadvantaged students.
- Hierarchical Logistic Regression

The main purpose of this study is to examine whether preschool education experience can help disadvantaged students become resilient students. The dependent variable in the study is a binary variable (1= being resilient student, 0= being non-resilient student), which necessitates a logistic regression. Moreover, data comes from the two dimensions: the student and the school. In order to reduce the impact of intraclass correlation, this study adopted hierarchical logistic regression for analysis.

Research Findings

The Cognitive Ability of Disadvantaged Students

Disadvantaged students have significantly poorer cognitive ability than their ordinary and advantaged peers. Family limitations in financial, cultural, and social capital have hindered the development of cognitive ability of disadvantaged students.

The Impact of Preschool Education Experience on Academic Resilience of disadvantaged students

After controlling for individual-, family-, school-, and district-related factors, preschool education experience can effectively predict the likelihood of disadvantaged children becoming resilient students. The disadvantaged students who have received preschool education had a 24.7% higher probability of becoming resilient students than those without any preschool education experience. Therefore, early childhood education is a potential booster of academic resilience of disadvantaged students.

The Heterogeneity Analysis

The rate of preschool enrollment of rural children is prominently lower than that of their urban peers. In terms of the difference in the effect of preschool education between rural and urban disadvantaged students, preschool attendance can well predict academic resilience of rural disadvantaged students, but has no significant influence on their urban counterparts' school resilience according to the results of heterogeneity analysis.

Conclusions

Preschool education is the start of one's lifelong training and an indicator of social equity. As a basic component of social welfare, preschool education affects the growth of hundreds of millions of children. High quality preschool service for disadvantaged children can compensate for the adverse impact of their unfavorable family background and potentially bridge the performance gap between disadvantaged and advantaged teenagers. We can conclude from the evidence based on CEPS data that: (i) Disadvantaged children' access to preschool education is still limited; their preschool attendance rate is below 70%, considerably lower than that of their ordinary and advantaged peers. (ii) Preschool education experience is beneficial to disadvantaged students in developing academic resilience. Early childhood education can effectively promote the growth of

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cognitive ability of disadvantaged students, indicating that it plays a compensatory role in offsetting the adverse effect of their disadvantaged socio-economic backgrounds. In addition, preschool education experience can effectively predict the probability of disadvantaged students' becoming resilient students, which is 24.7% higher than that among disadvantaged students without such experience.

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