Paper Title The Experimental Impacts of a School-Based Language Intervention in Village Kindergartens in Rural China

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The experimental impacts of a school-based language intervention in village kindergartens in rural China

Introduction

China represents a fertile site for testing hypotheses about the value of providing access to ECE even without traditionally cited features of quality. Efforts to rapidly expand access to ECE in rural China have created thousands of new centers. The purpose of this study is to evaluate whether access to those centers, even if they fail to meet the widely accepted international criteria of quality, shows positive effects on participating children.

Urban and rural China have very different economic and educational resources. Unlike many developed countries that have difficult-to-define urban and rural areas, China has a sharp legal distinction between urban and rural that is operationalized in the household registration system (Kirkby, 2018). This critical feature, the rural-urban divide, has persistently accounted for a significant share of income inequality. According to World Bank calculations, rural-urban variations accounted for 40 percent of total income inequality in 2003 in China (Yusuf & Saich, 2008). In 2016, the ratio of average per capita disposable income (PCDI) in urban China to the PCDI in rural China was 2.72 (China State Statistics Bureau, 2017).

While urban China is undergoing a growth spurt in ECE services, development in rural areas proceeds at a slower pace. To complicate matters, some rural areas are making quicker progress than others, so it is difficult to speak with certainty about the rural situation as a whole. Even neighboring townships and villages in the same county may differ in access to new ECE opportunities.

The study estimates the effectiveness of the Ke Cheng Bao Intervention (KCB), a language intervention holding at the poorest areas of China focus on improving Chinese rural young children's language (Chinese and English), memory, attention development. The school-based language intervention (hereafter, the Ke Cheng Bao, or the KCB) included a special focus on curriculum of Chinese and English vocabulary instruction and teacher training. We address the following research questions:

1. Does the *KCB* improve Chinese vocabulary development of Guizhou VEEC children?
2. Does the *KCB* improve English skills of Guizhou VEEC children?
3. Does the *KCB* improve the memory for digit of Guizhou VEEC children?
4. Does the *KCB* improve the visual attention of Guizhou VEEC children?

Methods

To estimate the causal impact of the *KCB* on language, digital memory and visual attention of Guizhou Village Early Education Center (VEEC), we used a cluster-randomized design. This trial involves randomization at classroom level and

collection of child-level outcome data. We randomized 596 children of 31 classes (18 in the treatment group, 304 children) in 31 VEEC centers of Guizhou Province. In September 2017, we conducted pretests of children's Chinese receptive vocabulary (PPVT) and expressive vocabulary (EVT), English, digital memory and visual attention. Background information of children and teachers are collected. After three weeks of pretest window, we randomly assigned KCB to 18 classes as the treatment group. The rest 13 classes kept their original daily routine as control group. In April 2018, we measured the posttest of the same assessments of the pretest.

Results

Across the six-month intervention, we collected pretests and posttests of children's development of Chinese receptive vocabulary, Chinese expressive vocabulary, English letter reading, English letter repeating, visual attention and memory for digit. As shown in Table 1, we used multilevel modeling framework employing generalized linear mixed models. After controlled the background information of children, we found that the intervention led to significant development of Chinese receptive vocabulary (effect size = 0.25), Chinese expressive vocabulary (effect size = 0.38), English letter recognition (effect size = 0.59), English letter repeating (effect size = 0.66), attention (effect size = 0.57) and visual recognition (effect size = 0.53). The intervention did not impact on children's digital memory skill.

Conclusion

The study provide empirical evidence to illustrate that embed appropriate early childhood education intervention programs can be an effective and economical way to improve rural young children's development. This study shows that an add-on language learning program can benefit children from extremely low socio-economic status background by providing extra daily learning experience. The implications for early childhood education policy-making in China are discussed.

Reference

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Table 1. Impacts of KCB on children's outcomes

		Outcomes						
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
		Chinese receptive voc	Chinese expressive voc	English speak letter	English read letter	Attention	Visual recognition	memory
Fixed effects								
KCB	γ_{11}	**2.49*** **(1.01)**	**3.59*** **(0.99)**	**3.03*** **(1.27)**	**2.89*** **(1.14)**	**21.80**** **(7.47)**	**2.06*** **(0.48)**	**0.73** **(1.31)**
Intercept	γ_{00}	-3.37 (5.72)	7.56 (5.69)	-3.77 (2.54)	-3.20 (2.05)	-22.75 (29.87)	-3.57 (2.18)	14.37*** (2.76)
girl	γ_{01}	✓	✓	✓	✓	✓	✓	✓
age	γ_{02}	✓	✓	✓	✓	✓	✓	✓
Left–behind	γ_{03}	✓	✓	✓	✓	✓	✓	✓
Only child	γ_{04}	✓	✓	✓	✓	✓	✓	✓
Minority group	γ_{05}	✓	✓	✓	✓	✓	✓	✓
Years in school	γ_{06}	✓	✓	✓	✓	✓	✓	✓
Family income	γ_{07}	✓	✓	✓	✓	✓	✓	✓
Maternal edu	γ_{08}	✓	✓	✓	✓	✓	✓	✓
Father's edu	γ_{09}	✓	✓	✓	✓	✓	✓	✓
Picture book	γ_{010}	✓	✓	✓	✓	✓	✓	✓
Random-effects								
Level 2. Initial	σ_{ε}^2	0.50 (2.03)	0.08 (4.92)	3.41 (0.46)	3.10 (0.40)	15.60 (3.57)	0.85 (0.26)	3.48 (0.45)
Level 2. Residual	σ_{i}^2	9.79 (0.33)	9.78 (0.32)	3.41 (0.12)	2.65 (0.09)	46.80 (1.59)	3.53 (0.12)	3.76 (0.13)
Goodness of fit								
-2LL		3546	3544	2626	2396	5064	2582	2714
Effect size								
		0.25	**0.38**	**0.59**	**0.66**	**0.57**	**0.53**	**-**

*p < 0.05; **p < 0.01; ***p < 0.001；✓ means we controlled the covariates.
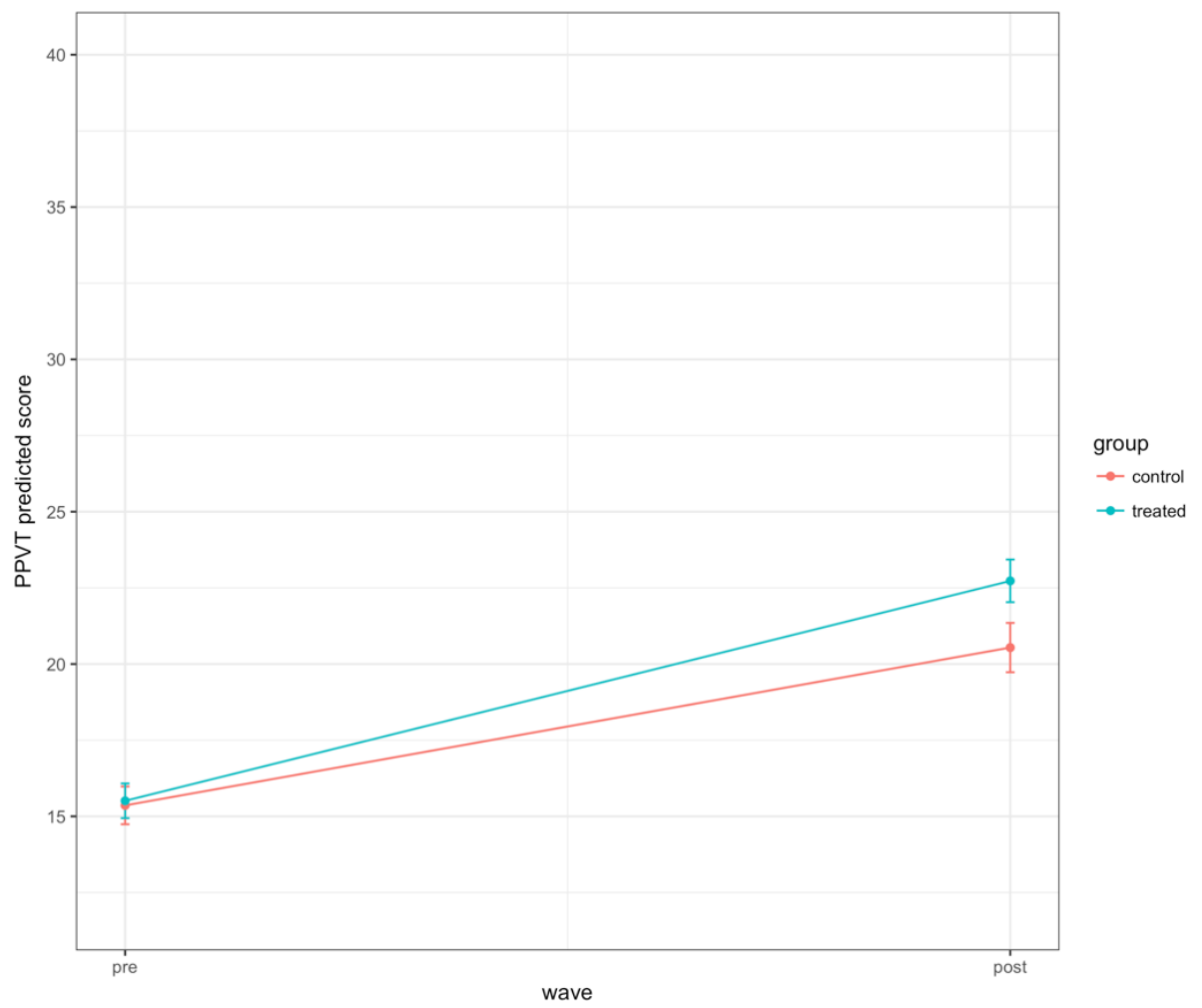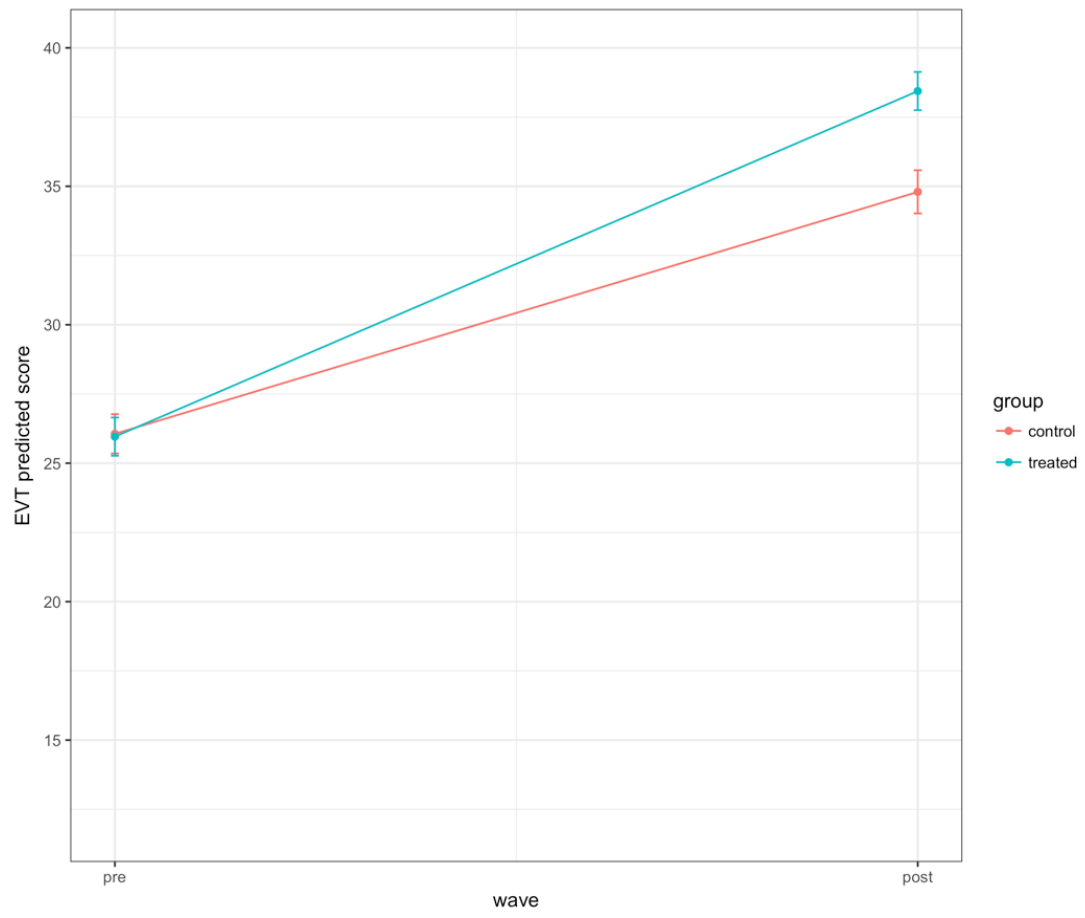
Figure 1. Impacts on Chinese receptive vocabulary

Figure 2. Impacts on Chinese expressive vocabulary