

# One Year of Preschool or Two - Is it Important for Adult Outcomes?



Irma Arteaga, Sarah Humpage, Judy Temple and Arthur Reynolds  
Institute of Child Development & Department of Applied Economics, University of Minnesota



## Research Questions

- What is the effect of a second year of high-quality preschool on long-term and adult outcomes?
- Does the impact of a second year of preschool vary for different subgroups (e.g., at-risk or low-income children)?

This research has implications for policy-makers in deciding whether to expand preschool to earlier ages and for prevention practice in strengthening interventions.

## Sample and Selection Bias

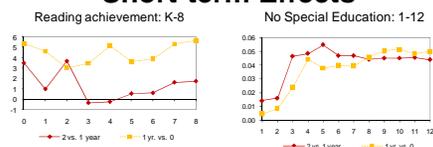
This study uses data from the Chicago Longitudinal Study (CLS), an ongoing project investigating the long-term effects of the Child Parent Center (CPC) preschool program on minority children in high-poverty neighborhoods of Chicago. The study follows a cohort of 1,539 children that entered kindergarten in 1985. The CPC program emphasized literacy and parent involvement; this sample was composed of 989 children. The comparison group included 550 children that were chosen to be as closely matched as possible in terms of student and neighborhood demographic characteristics.



Characteristics	Years of CPC		
	0	1	2
Number of sites	13	20	20
Age of entrance to CPC	N/A	3.95	4.00
Percent in high-poverty area	73%	76%	79%
Percent in full-day kindergarten	100%	60%	60%
Percent in school-age program	30%	68%	70%
Percent African-American	93%	90%	95%

However, this research focuses not on the overall effect of CPC preschool, but the effects of 2 versus 1 year of CPC preschool. Assignment to 1 or 2 years was not randomly assigned. Thus a logical concern is that individuals who attended 2 years of preschool could be different from individuals who attended 1 year.

## Short-term Effects



The marginal effect of 1 year on reading is significant at the 5% level for all years; the effect of 2 years is significant in kindergarten and 2<sup>nd</sup> grade. Similar effects are found for math and grade retention (see hand-out). The effect of 2 years on receiving special education services is significant at the 10% level for every grade but 1<sup>st</sup> grade. The effect of 1 year is significant for grade 4 and 9-12.

## Methodology

This study uses a methodology developed by Imbens (2002). It allows adjustment for preexisting observed differences among the groups (selection bias) using a propensity score weighting method when an intervention is non-randomized. This method creates a reweighted data set that better resembles a randomized experiment. Individuals are assigned larger (smaller) weights if their observed intervention status is underrepresented (overrepresented) given their covariates. Wooldridge (2007) finds this method efficient and unbiased.

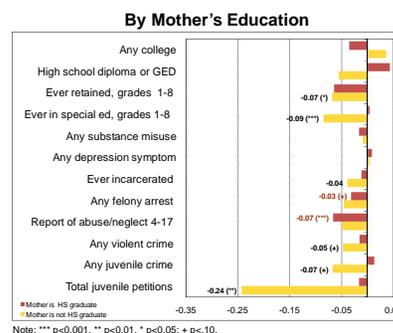
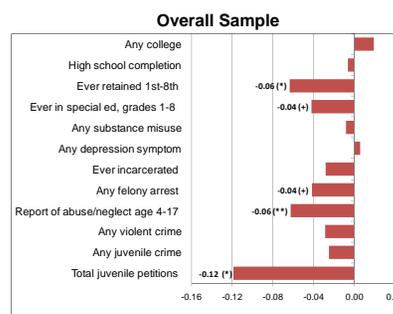
**Step 1:** Using a multinomial probabilistic regression the probability of receiving 0, 1 or 2 years of CPC preschool is estimated controlling for child's characteristics, family risk factors and neighborhood characteristics.

**Step 2:** These estimated probabilities, propensity scores, are used to construct the weight (inverse of the propensity score).

$$weight = \frac{1}{\hat{p}_{cpc=i}}$$

**Step 3:** The outcome equation (e.g. any felony arrest) is estimated weighting by the inverse of the propensity score.

## Effects of a 2<sup>nd</sup> Year of Preschool



## Methodological Conclusions

- The use of propensity score weighting is an efficient way to address potential selection bias in a non-randomized multiple dose intervention.
- Researchers and policy analysts should investigate selection when dealing with non-randomized studies.
- This propensity score strategy can be widely used in other situations.

## Summary and Policy Implications

- Overall, a second year of preschool has positive long-term benefits that exceed costs.
- A second year of preschool had significant effects on grade retention and special education; these can be of greater magnitude than the first year's effects.
- A second year of preschool has long-term effects on child maltreatment and juvenile crime, but not on educational attainment, substance misuse, and depressive symptoms.
- If policy-makers are interested in enhancing school readiness and reducing juvenile crime, investing in two years of preschool is a sound investment.
- Given greater and more significant results for at-risk children, finite resources for a second year of preschool should be selectively targeted.

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## Contacts

Irma Arteaga: [arte0010@umn.edu](mailto:arte0010@umn.edu)  
Sarah Humpage: [humpa087@umn.edu](mailto:humpa087@umn.edu)  
More information on the Chicago Longitudinal Study: <http://cehd.umn.edu/icd/cls/>

With the 1-year group as the base group, these bars show the estimated marginal effect of a second year of CPC preschool. Value labels indicate the coefficient is statistically significant.