

Paper Symposium: Integrative Statement
As the Twig is Bent....Sustained Effects of Contemporary Public PreK Programs

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Thirty-five years ago the Cornell Consortium for Longitudinal Studies (1983) issued a landmark report documenting the lasting effects of a variety of high-quality preschool programs on life course outcomes through early adulthood. Along with changing demographic trends, such findings led to dramatic increases in enrollment in early education in the following decades. Since 80% of young children currently participate in some type of center-based education, including state prekindergarten, do these routine and usually publicly-funded programs yield sustained effects? The wide variability in quality and absence of key elements of effectiveness in most programs indicate that relatively few programs would produce lasting gains. This variability may explain mixed effects reported in recent years.

This symposium reports findings from three current and routinely implemented public PreK programs sponsored by states and school districts: Child-Parent Centers in Illinois and Minnesota districts, Tulsa's Universal PreK program, and Michigan's Great State Readiness Program. They have not only implemented key principles of effectiveness but have conducted longitudinal studies through at least middle childhood. Although the programs differ in geographic context, program elements, and population characteristics, they have assessed key school performance outcomes. They each show evidence of sustained effects.

Each project addresses three questions: (a) What are the program elements and implementation context? (b) What is the research design and key findings on impact?, and (c) How can the findings be used to improve quality in the field at large? The Discussant will expand upon these questions and address lessons for improving effectiveness in contemporary programs.

Sustained Effects of the Child-Parent Centers in Chicago and the Midwest Expansion

Arthur J. Reynolds, Brandt A. Richardson, Suh-Ruu Ou, and Sangyoo Lee

Early childhood programs demonstrating sustained positive effects and high economic returns have shown six common elements: (a) low child-to-staff ratios (under 18 to 2), (b) intensive focus on language and literacy within a whole-child, developmental philosophy, (c) comprehensive family services, (d) BA-level teachers and/or compensation competitive with schools, (e) frequent monitoring and feedback, and a (f) supportive organizational context of implementation. The Child-Parent Centers (CPC) in the Chicago Public Schools is one of the programs with these elements and sustained impacts. Title I-funded and the oldest public preschool after Head Start, CPC is a contemporary program that is feasible to scale. Until 2012, however, the program had not been scaled to diverse populations or expanded outside of Chicago.

In this study, we (1) analyze the effects of the original CPC cohort in the Chicago Longitudinal Study (CLS), (2) assess whether the current program expansion in Chicago and Saint Paul (MN)—three decades after the CLS—yields similar effects through 3rd grade, and (3) identify the program elements most responsible for gains.

Program, Design, and Data

The CPC program in the CLS (Reynolds, 2000; Reynolds & Ou, 2011) and Midwest Expansion in Chicago and Saint Paul (Midwest Longitudinal Study [MLS; Reynolds et al., 2016a]) implemented

beginning in 2012 (on-going) are operationally similar in that a leadership team runs the program to provide intensive learning in small classes from preschool to 3rd grade (Reynolds et al. 2016b). Among revisions, full-day preK is offered and on-site coaching and monitoring is more intensive. For both program studies, a matched-group quasi-experimental design was implemented for 1,539 (CLS) and 3,129 (MLS) students (Table 1). On-going longitudinal data on school readiness, parent involvement, and 3rd grade reading and math achievement were compared and lasting effects to age-35 are reported in the CLS. Recovery rates exceed 80%.

Results

MLS CPC preschool services were implemented with high quality and yielded practically significant effects on school readiness in Chicago ($d = .48$ SD) and Saint Paul ($d = .40$). These were comparable to the CLS CPC ($d = .63$), especially after considering that the entire comparison group in MLS enrolled in district preschool (only 15% did in CLS). These results demonstrate effective program scale up. Effects on parent involvement in school also were similar between studies and gains were sustained in kindergarten through 3rd grade benchmark achievement ($ds = [.24, \text{MLS}; .28, \text{CLS}]$). CPC CLS impacts continued up to age 35 in higher rates of earned AA/BA degree and greater earnings (Table 1). MLS analysis showed that as more elements were implemented, especially small classes, the greater the sustained gains. Further analysis of cohorts through ages 38 and 10, respectively, will be reported.

Conclusion

In the first scale up of one of the most effective early childhood programs, CPC showed positive effects up to 3rd grade thereby supporting generalizability of the CLS findings from a 30-year cohort study. Small classes (<18) in preschool were associated with greater gains, and a Saint Paul cost-saving measure that leadership teams serve two sites rather than one showed good results. Further expansion in Normal (IL), Rochester (MN), and Madison (WI) will be assessed.

THE EFFECTS OF TULSA'S UNIVERSAL PRE_K PROGRAM ON MIDDLE SCHOOL OUTCOMES

By William Gormley, Georgetown University, and Sara Anderson, West Virginia University

As states have upgraded their commitment to PreK education, questions have arisen. Critics argue that program effects are likely to fade out or disappear over time, while supporters contend that program effects persist under certain conditions. A recent consensus statement on early childhood education's longer term effects found evidence of both fadeout and persistence (Phillips et al., 2017). Few studies of pre-K, notably those that are universal, have followed students through to middle school or beyond, and this study takes an important next step. The present study examines the relation between pre-K and students' academic and behavioral achievement through middle school.

We focus on Tulsa Public Schools students who enrolled in kindergarten in the fall of 2006. Using data from four Tulsa area school districts and the state of Oklahoma and propensity score weighting, we estimate the effects of Tulsa's universal pre-K program on multiple measures of academic performance and behavior for middle school students. Propensity score and multiple regression covariates were derived from school administrative data and a parent survey from fall 2006; variables include maternal education and marital status, presence of the biological father at home, Internet access, the number of books in the home, child care at three years old, free lunch status, gender, and race. Our data base includes 1,992 students for some outcomes, 2,656 students for others, depending on whether outcomes were from the school districts or state, respectively. Outcomes included state standardized test scores, grades, honors course enrollment, special education status, attendance, suspensions, and grade retention.

We used multiple imputation, generating 40 imputed datasets, given missing data on student covariates. Descriptive statistics are found in Table 1.

We find enduring effects on math achievement test scores, enrollment in honors courses, and grade retention for students as a whole, and similar effects for certain subgroups (see Table 2). We conclude that some positive effects of a high-quality pre-K program are discernible as late as middle school and discuss implications for a high school follow-up. We hope to be able to report preliminary findings for the effects of Tulsa’s universal pre-K program on early enrollment in Algebra I and AP courses, performance on PSAT and pre-ACT tests, and high school dropout rates.

Long-term Effects of Michigan’s State-Funded Preschool Program

Tomoko Wakabayashi, Oakland University, Lawrence J. Schweinhart, HighScope Research Foundation, and Zongping Xiang

Established in 1985, Michigan’s Great Start Readiness Program (GSRP; renamed in FY2009 from Michigan School Readiness Program) is a state-funded preschool program for four-year-olds, at risk of educational failure. In 1995, a longitudinal evaluation was launched, which currently is one of the only state-funded preschool program evaluations that followed children through high school graduation. The evaluation served to inform continuous quality improvement and to show impact that generalizes across the state. The positive findings, reported in 2012, leveraged a \$130 million expansion of GSRP.

Research Question and Study Population

The premise of GSRP is that high-quality preschool can mitigate risk factors and support the school readiness and subsequent achievement for children with demographic factors that predispose them to poorer school and life outcomes. The key research question, therefore, was whether GSRP participation improves school success. We also asked whether the GSRP expansion of 2013-2015 enabled the state to spread the benefit of GSRP to more eligible children.

The evaluation sampled geographically and demographically representative GSRP programs across six Michigan school districts – Detroit, Grand Rapids, Grayling, Kalamazoo, Muskegon, and Port Huron. 338 children attended GSRP in the 1995-1996 school year, and 257 children did not attend a preschool program but had family incomes under \$30,300, low enough to qualify for GSRP. Table 1 compares the background characteristics of the two groups of children. The groups did not differ at entry.

Methods and Results

Matched comparison quasi-experimental design was used to follow treatment (GSRP) and comparison (non-GSRP) children through high school graduation. We also analyzed the benefits and costs associated with GSRP’s two-year expansion.

GSRP participants outperformed comparison groups on school success indicators, with the most prominent being grade retention at every stage of the evaluation (kindergarten entry, 2nd grade, 4th grade, middle school, high school graduation; Daniel-Echols & Schweinhart, 2007; Florian, Schweinhart, & Epstein, 1997; Xiang & Schweinhart, 2002; Xiang, Schweinhart, Hohmann, Smith, Storer, & Oden, 2000). At high school graduation, children who participated in GSRP were retained less often, and graduated on time significantly more than those who did not participate (Figure 1; Schweinhart, Xiang, Daniel-Echols, Browning & Wakabayashi, 2012). Grade retention, by itself, led to almost twice as many high school dropouts as high school graduations. GSRP group also scored higher on Michigan Merit Examination in Mathematics and Mathematics and ELA combined (see Table 1 for retention and achievement results).

Discussion and Implications

From its inception to 2018, the total funding for GSRP grew from \$1,000,000 to \$233,600,000 (plus \$10,000,000 for transportation). The number of slots available to serve children grew from 694 (part-day) to 32,220 (school-day). The recent benefit-cost analysis based on the high school graduation results show that the GSRP expansion will more than double the investment through increased lifetime earnings, reduced public health costs, crime, and welfare receipts. Besides the the long-term effects of GSRP, we also discuss results from RDD, and interviews with GSRP administrators and program staff across the state on how GSRP sustained its high-quality programming while also increasing the access during its recent expansion.

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Presentation 1: Child-Parent Centers

Table 1:

Characteristics and Impacts of the Child-Parent Center (CPC) PreK Program in the Chicago Longitudinal Study and Midwest Longitudinal Study CPC Expansion

Characteristic	MLS Chicago/St. Paul	CLS Chicago
Total sample size	3,129	1,539
Program, Comp. sample sizes	2027, 1102	989, 550
Black/Hispanic/Asian (%)	60/32/3	93/7
Family income < 185% FPL	80%	92%
Baseline equivalence metrics	Pretests, IPW	Risk index, IPW
Year of Prek	2012-13, 2013-14	1983-84, 1984-85
Last age at follow up	35 years	9 years
School readiness (ES in SD units)	.43	.63
Kindergarten achievement (ES)	.37	.35
Parent involvement (ES)	.37	.46
Absenteeism (% reduction over comp.)	45% for Chi full-day prek	n/a
3 rd grade reading/math (ES)	.24 (Chi)	.28
6 th grade reading/math (ES)		.27
8 th grade reading/math (ES)		.30
Special ed by 12 th grade (% reduction over comp.)		41%
Grade retention (% reduction over comp.)		40%
Juvenile arrest (% reduction over comp.)		33%
HS completion by Age 21 (% increase over comp.)		20%
AA/BA by Age 35 (% increase over comp.)		47%
Income > \$20,415 by Age 35 (% increase over comp.)		19%

Note. All differences are significant at the .05 level and are adjusted for differences in baseline characteristics. Robustness testing shows consistent patterns of impacts. Blank fields indicate not assessed. MLS sample is currently 10 years of age. FPL = Free and reduced price lunch; IPW = Inverse Probability Weighting. ES = effect size is standard deviation units.

Presentation 2: Tulsa PreK

Table 1: Means and standard deviations (SD) for pre-k and comparison group

Covariate	TPS Pre-K		Comparison	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Female (%)	47%	0.50	48%	0.60
Live with father at K (%)	60%	0.61	55%	0.63
Race (%)				
<i>White</i>	30%	0.32	38%	0.48
<i>Black</i>	38%	0.64	27%	0.45
<i>Hispanic</i>	23%	0.32	24%	0.42
<i>Asian</i>	2%	0.13	2%	0.13
<i>Native American</i>	8%	0.26	10%	0.13
Mother's marital status at K (%)				
<i>Never Married</i>	28%	0.51	29%	0.58
<i>Married</i>	53%	0.62	49%	0.62
<i>Remarried</i>	3%	0.22	3%	0.23
<i>Separated</i>	6%	0.35	7%	0.35
<i>Divorced</i>	8%	0.35	10%	0.35
<i>Widowed</i>	2%	0.22	2%	0.29
Mother's education at K (%)				
<i>no high school</i>	22%	0.48	23%	0.53
<i>high school</i>	28%	0.60	27%	0.64
<i>some college</i>	36%	0.62	35%	0.66
<i>college</i>	14%	0.42	15%	0.45
Lunch Status at K (%)				
<i>free lunch</i>	66%	0.48	64%	0.48
<i>reduced price lunch</i>	12%	0.32	9%	0.29
<i>full price lunch</i>	22%	0.42	26%	0.44
Neighborhood median income (in thousands)	37.03	17.03	40.42	21.25
Overage (6 years old) at K (%)	1%	0.10	4%	0.19
Foreign born (%)	22%	0.45	20%	0.45
English language learner (%)	19%	0.45	19%	0.43
Attended daycare at someone's home at age 3 (%)	20%	0.58	20%	0.55
Attended non-TPS pre-school at age 3 (%)	15%	0.58	21%	0.54
Attended Head Start at age 3 (%)	22%	0.59	18%	0.61
Attended some type of center based care at age 3 (%)	23%	0.58	30%	0.68
Internet access at home (%)	48%	0.58	45%	0.68

Presentation 2: Tulsa PreK

Table 2: Propensity-score weighted multiple regression results for Tulsa pre-K

VARIABLES	Math Test Score	Reading Test Score	GPA	Honors	Gifted	Repeat a grade
Full Sample						
Propensity Score weighted	8.93* (3.72)	5.50 (3.41)	0.05 (0.04)	0.34* (0.14)	-0.00 (0.02)	-0.50*** (0.12)
<i>Gender</i>						
Male	8.46 (5.23)	6.05 (4.96)	0.06 (0.06)	0.56** (0.21)	0.02 (0.22)	-0.54*** (0.14)
Female	9.56+ (5.03)	4.74 (4.46)	0.04 (0.05)	0.22 (0.21)	0.00 (0.03)	-0.42* (0.18)
<i>Lunch Status</i>						
Free	9.29* (4.60)	6.05 (4.17)	0.06 (0.05)	0.37* (0.17)	0.00 (0.02)	-0.48*** (0.12)
Reduced	5.47 (12.06)	-3.06 (11.58)	-0.13 (0.11)	-0.01 (0.61)	-.01 (0.07)	-1.11* ^b (0.49)
Paid	13.76+ (7.12)	8.54 (6.28)	0.01 (0.08)	0.52 ^b (0.36)	0.01 (0.05)	-0.42 (0.32)
<i>Language</i>						
Current or Former ELL	18.36+ (10.27)	13.32 (9.07)	0.13 (0.09)	0.14*** (0.05)	0.05 (0.04)	-0.86*** ^c (0.29)
<i>Race</i>						
White	15.71* (6.15)	5.34 (5.87)	0.04 (0.07)	0.08 (0.29)	0.00 (0.04)	-0.43* (0.19)
Black	-1.57 (6.23)	-3.27 (5.88)	-0.04 (0.06)	0.04 a (0.04)	0.02 (0.03)	-0.52** (0.19)
Hispanic	13.72 (8.62)	12.55+ (7.56)	0.11 (0.08)	0.12*** (0.04)	0.01 (0.03)	-0.83*** (0.25)

*** p<0.001, ** p<0.01, * p<0.05, + p<.10

Presentation 3: Michigan Preschool Program

Table 1

GSRP Longitudinal Study Outcomes

Background Characteristic	GSRP	No GSRP	
Age at kindergarten entry	5.3	5.3	
% female	51%	51%	
Fathers in home	62%	61%	
Persons in household	4.5	4.7	
Mothers' years of schooling	12.1	12	
Fathers' years of schooling	12.1	11.7	
Average annual income	\$17,882	\$18,022	
Grade Retention Status by Grade 12	(n=318)	(n=240)	
Never retained in grade (<i>n</i> = 323)	63.2%**	50.80%	
Repeated at least one grade	36.80%	49.20%	
Repeated one grade (<i>n</i> = 149)	24.20%	30.00%	
Repeated two grades (<i>n</i> = 63)	9.70%	13.30%	
Repeated three grades (<i>n</i> = 23)	2.80%	5.80%	
Academic Proficiency at Grade 11/12	(n=289)	(n=214)	Statistically significant at <i>p</i> < .05?
<u>Mathematics</u>			
Proficient	26.60%	22.00%	Yes
Partially proficient	11.80%	8.90%	
Not proficient	34.30%	34.60%	
Did not take the test	27.30%	34.60%	
<u>English Language Arts (reading and writing)</u>			
Proficient	28.40%	26.20%	
Partially proficient	30.40%	28.50%	
Not proficient	15.20%	10.30%	
Did not take the test	26.00%	35.00%	
<u>Combined</u>			
Proficient on both	20.40%	18.70%	Yes
Partially proficient on both	17.60%	12.10%	
Not proficient on either or both	36.30%	34.60%	
Took neither test	25.60%	34.60%	

**p* < .01; GSRP percepts are not adjusted for the effects of 7 covariates.

Note: Tested by ordinal regression analysis adjusted for the effects of 7 covariates. The 7 covariates are age, gender, race, special education status in earlier grades, level of mother education at school entry, free lunch status grade 6-12, and frequency of school transfers grade 6-12.

Presentation 3: Michigan Preschool Program

Figure 1

High school graduation results

