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Expanding Access to Quality Pre-K is Sound Public Policy

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Executive Summary

In 2013, preschool education received more attention in the media and public policy circles than it has for some time, in part because of a series of high-profile proposals to expand access to quality pre-K. The scientific basis for these proposed expansions of quality pre-K is impressive. This paper brings to bear the full weight of the evidence to address the following questions:

- What does *all* the evidence say about effective preschool education and long-term cognitive benefits? A statistical summary of studies since 1960 demonstrates that effects persist, and provides evidence about what works (intentional teaching with small groups).
- What are the estimated effects of state and local pre-K programs in more recent years? We provide estimated effect sizes for school readiness at K and later achievement for studies from the last couple of decades. Effects vary across programs, but are overwhelmingly positive. Long-term achievement gains tend to be smaller, but still can be substantial.
- Is Head Start ineffective? A national randomized trial of children who attended Head Start in 2002 found modest initial effects and failed to detect lasting impacts. That study underestimates effects by design, its greatest limitation; nevertheless, the results were disappointing. Since then Head Start has been subject to reform, including a Bush Administration emphasis on improving literacy and more teachers with college degrees. Data collected in 2003, 2006 and 2009 show large increases in the size of Head Start children's language and literacy gains between 2003 and 2009.
- Can government improve the quality of public preschool education? Head Start provides one example, as described above. New Jersey provides another. It raised standards and implemented a continuous improvement system that transformed early care and education in 31 cities from bad to good over eight years. The latest follow up on the New Jersey children finds large gains in achievement and school success through grade 5.
- If states expand pre-K with temporary federal matching funds, what happens to state education budgets when that federal money is not available? NIEER projects that in 2030 all but 1 state would spend less on education from pre-K through grade 12 under federal proposals that incentivize states to raise pre-K quality standards, offer a full school day, and serve all children under 200 percent of the federal poverty level. Idaho is the only state that might have to pay a little more, because it has relatively low grade repetition and special education costs.

Given the answers to these questions it seems self-evident that local, state, and federal governments should expand access to quality pre-K and other enhancements of early education, especially for children in low-income families.

Expanding Access to Quality Pre-K is Sound Public Policy

In 2013, preschool education received more attention in the media and public policy circles than it has for some time, in part because of a series of high profile proposals to expand access to high quality pre-K. The President was among those leading the way with a new proposal highlighted in his State of the Union Address. A bipartisan group in the Congress recently introduced legislation (the Strong Start for America's Children Act) that builds on the President's proposal. Meanwhile, several governors put forward their own proposals to expand access to pre-K, including Rick Snyder of Michigan and Jay Inslee of Washington. Cities have stepped up as well, with pre-K expansion and improvement initiatives in New York City, San Antonio, and Seattle among others.

The scientific basis for these proposed expansions of quality pre-K is impressive. It is well established that the first five years are a time of rapid development that is especially sensitive to a child's experiences. It is equally well established that some children have far less optimal conditions for their development, with the least access to good early education by children whose parents have the lowest incomes and education (Barnett & Nores, 2013). In 2005, a national study of the quality of pre-K found that most programs were not good, and quality was lowest for those children whose parents had the least education (Barnett & Nores, 2013). Yet, rigorous studies find that strong preschool education programs can meaningfully enhance early learning and development and thereby produce long-term improvements in school success and social behavior that generate benefits to individuals and the broader society far exceeding costs. Studies also find that not all programs are equally successful, and this has led to a push for policies to expand access to public pre-K and other early education programs more closely resembling the most effective models.

All of this activity has brought out opponents who strenuously object to public funding to improve the educational quality of pre-K. They raise the specter of government kidnapping young children and mind control. Yet, participation in every public pre-K program is entirely voluntary. All of the major recent proposals for pre-K improvement and expansion offer substantial parental choice and include private providers, as do most existing state-funded pre-K programs. Federal proposals call for no permanent federal role and actually reduce federal control over programs for 4-year-olds. Still opponents appear to prefer the status quo or public funding for low-quality child care with no expectation of positive outcomes for children to quality preschool education.

To bolster their arguments these critics pick through the research Goldilocks-like to choose the few they find "just right," dismissing other studies as too small, too old, too specialized, and so forth. This is not a valid way to summarize the science on pre-K in order to inform policy development. In particular, policymakers should not look at the results first in deciding which studies to rely on, and, looking at the critics' choices, it seems that this is how they proceed. It would be particularly dangerous for the public and policymakers to ignore the evidence that policies which encourage poor quality child care can actually harm the development of children. Such evidence comes from the United States, Canada, and Europe (Barnett, 2008).

A more valid approach is to statistically summarize the results of all the studies, regardless of their results. Such a meta-analysis has been conducted (Camilli et al., 2010), and it finds that on average preschool programs have substantial positive impacts on cognitive development. It also finds that effects decline over time, with long-term effects half the size of initial impacts. It follows that to obtain substantial long-term gains pre-K policies must support higher quality programs that produce large initial impacts. The meta-analysis also points to intentional teaching, particularly one-on-one and with small groups, as a means to produce larger cognitive gains, a finding unlikely to surprise either teachers or parents.

Of course, this meta-analysis includes all types of preschool programs, and today's large scale publicly funded pre-K might not produce the same results as other programs. In fact, by and large, public programs on average have been less effective than better funded, more rigorous small-scale programs, which is precisely why we must raise the quality of public programs. However, this does not mean that current public programs are completely ineffective, or that their benefits do not exceed their (lower) costs. One way to assess how well future public programs might perform is to examine the results of relatively recent studies of state and locally funded pre-K.

Tables 1 and 2, as well as Figures 1 through 4, present the results of research on state and locally funded pre-K programs from the last two decades. To display all of the variation among studies we report standardized effect sizes for each study rather than simply presenting averages. Effect sizes translate effects into standard deviation units. To evaluate them, it may help to know that the achievement gap between disadvantaged children and others is about 1 standard deviation. Thus, an effect size of .10 is equivalent to 10 percent of the achievement gap. Figure 1 displays the number of effect sizes of each size for immediate impacts of which there are many. Figures 2-4 report one effect size for each study in each of three grade ranges 1-2, 3-6, and 7-8. When a study has more than one effect size in a grade range we report an average. As can been seen, recent research on public pre-K provides substantial data on outcomes in all but the last grade range.

Two points are clear. First, state and local pre-K programs, almost without exception, are found to improve academic readiness for school, sometimes quite a lot. Second, there is substantial evidence of persistent impacts on achievement well beyond school entry, even though these are somewhat smaller than short-term impacts. More traditional reviews that scan the entire literature rather than relying on a few selected studies produce a similar picture with the addition of a more balanced view of Head Start effects(Barnett, 2008; Yoshikawa et al., 2013)

In my view, some slippage between initial and later effects should be expected from any pre-K program (Barnett, 2011). Ask Jeff Gordon if leading for the first 30 laps at Daytona is enough to guarantee a win. Pre-K prepares children to start off well. It does not guarantee that nothing later on will interfere with their progress. We should not conclude from this that pre-K does not matter. Schools spend a lot of time and money helping children who are behind catch up at least part way, and reducing the need for this spending is part of what good pre-K is all about. Moreover, just as an early lead does not guarantee a win, it is equally true that you cannot fall far behind the leader's pace for 30 laps and count on making up all of the difference later, whether at Daytona or in school.

That some public pre-K programs seem to perform much better than others is an issue of concern. The major preschool proposals that have drawn the most interest this year all focus on improving public programs. They emphasize raising standards and putting in place continuous improvement and accountability systems to ensure the new programs deliver strong results. None of them are satisfied with business as usual. While it would be foolish to assume that we know everything about how to make pre-K highly effective, we do know how to create more effective policies with continuous improvement and accountability systems that will generate the information each teacher, community, and state needs to improve from there on. There is no denying that such an approach actually works. Under court order to provide quality pre-K to all children in 31 cities, New Jersey raised standards and implemented a continuous improvement system that demonstrably transformed quality from poor-to-mediocre, to primarily good-to-excellent over eight years. Follow-ups with the children through grade five found substantial improvements in achievement and school success all along (Barnett, Jung, Youn, & Frede, 2013).

One study that receives considerable attention in the debates on these new pre-K proposals (despite the fact that it is not a study of state funded pre-K) is the national evaluation of Head Start's impacts. Without question the results were disappointing, though not as disappointing as the critics portray by focusing on figures known to underestimate Head Start's effects. The Camilli et al. (2010) meta-analysis clearly predicts disappointing results as it suggests two key reasons for Head Start's modest effects. One is that Head Start did not focus on intentional teaching and, at least in my own experience, sometimes actually discouraged it. The other is that Head Start has been given a huge mission with a very broad range of family and child outcomes; it has been asked to do too much with too little. It is important that Congress and others not repeat these mistakes with the new initiatives.

That is why the President's proposal and the Strong Start for America's Children Act focus on improving teaching and school readiness, not just in pre-K, but in other programs that receive federal funds. We can do better, and we will, if proposals like these become law. Interestingly, evidence from this comes not just from state efforts like the New Jersey example discussed above, but also from Head Start. The Head Start national impact evaluation was conducted on children who attended that program more than a decade ago. Since then Congress and the Administration have mandated reforms. Not all of these have been fully implemented yet, but Head Start has focused more on school readiness, and raised its standards. Results from more recent years may surprise Head Start's critics.

Head Start's Family and Child Experience Surveys (FACES) measured children's learning during a year of Head Start in the 2003, 2006, and 2009 school years. The national impact evaluation was conducted on children entering Head Start in the 2002 school year. FACES 2003 provides the closest FACES measure of how much children gained in Head Start at the time of the national impact study. The latter two FACES surveys allow us to compare children's gains in later years on the same tests administered in the same way to a similar sample. (The national impact study sample was restricted in several ways and includes only centers with excess applicants who could be randomly assigned.) FACES average test score gains in language, literacy, and math for 2003, 2006 and 2009 are reported by age and ethnicity in Table 3, and displayed graphically in Figures 5 through 7.

As shown in Table 3, children made greater gains in language and literacy in 2006 and 2009 than in 2003. Language and literacy gains are larger for all three major ethnic groups in 2009 compared to 2003, sometimes two or more times as large. This suggests that policy changes, particularly the Bush Administration's literacy push, may be responsible. Other data from FACES indicate that the frequency of intentional literacy activities and the percentage of teachers with a 4-year college degree both increased by 2009 (Hulsey et al., 2011). For math, the results are erratic in ways that are hard to explain, and there is no clear pattern, raising questions about the adequacy of that test. The strong 2009 language and literacy gains are especially notable, since families had been negatively affected by the recession, which might be expected to depress growth. It seems fair to conclude that some learning gains for Head Start children have greatly improved since the Impact Study, and this improvement is plausibly attributed to reforms including those specifically focused on language and literacy.

One challenge faced by state policy makers when they seek to raise quality and expand access, is that the cost of quality pre-K must be paid up front, while most of the benefits accrue many years later. This poses a cash flow problem for state governments that want to expand quality pre-K even when the long-term cost-savings to a state would eventually lead to lower costs. This is a key reason that temporary federal funding for quality pre-K--as proposed by the President and the Strong Start for America's Children Act--makes sense. It creates no permanent federal obligation and leaves states in charge of pre-K, but helps states cover costs of improving access to quality pre-K until substantial offsetting cost savings are returned to the state.

Naturally, state leaders are concerned about what would happen to their costs in the long-term if a federal government program provided only 10 years of funding as has been recently proposed. At the end of 10 years, states would have higher standards and expanded enrollment that raised the costs of pre-K, but no continued federal support. To what extent would the cost-savings in K-12 generated by pre-K be expected to offset increased state expenditures? To answer that question, NIEER estimated for each state the net impact of the President's proposal on state education expenditures pre-K through grade 12 in the year 2030 after any federal cost sharing had stopped. These projections only address the long-term state budget question. They are not benefit-cost analyses, and they focus only on cost savings to K-12 while ignoring other long-term benefits found for pre-K (e.g., increased achievement, decreased risky behaviors and crime, increased earnings).

Our projections require a number of estimates and assumptions. To estimate expenditures for pre-K we use cost-per-child figures for each state, calculated for a full day pre-K program meeting all 10 of the quality standards benchmarks employed in NIEER's annual survey of state pre-K (Barnett, Carolan, Fitzgerald & Squires, 2012). We use 2030 population estimates from the Census to account for changes in the number of children in each state, and assume that states serve all children under 200 percent of the federal poverty level (FPL), plus any additional children eligible under their current laws.

Cost savings in each grade level are estimated assuming that new, improved pre-K programs produce the same percentage decreases in grade repetition and special education as one year of New Jersey's Abbott pre-K program at grade 5. For example, in a state with 10 percent retention in 3rd grade, the estimated reduction for children who attended pre-K is 4 percentage points. In a state with 5 percent

retention in 3rd grade, the estimated reduction for children who attended pre-K is about 2 percentage points. This is a conservative assumption in one respect as children under 200 percent of FPL have rates of grade repetition and special education that typically exceed the state average. On the other hand, as the New Jersey model we rely on has not produced data on prevention of high school dropout, we do not project any cost increase from a greater number of students in the later grades. This could lead to underestimation of future costs.

Finally, we net out the impacts of current state pre-K programs by assuming that current cost savings from pre-K are proportional to current expenditures per child. In other words, if a state pre-K program currently serves 10,000 children at half the projected cost of a quality full-day program, then projected future cost-savings for the first 10,000 children enrolled are reduced by half.

We present our projections in Table 4. Remarkably, *we project that in 2030 with no continuing federal support, every state except Idaho would spend less money on education from pre-K through grade 12 if they met the quality standards, operated for a full school day, and served all children under 200 percent of FPL*. For Idaho the estimated cost increase is small, and possibly overestimated. Annual cost reductions varied from about $25 million in Arkansas, which already has a relatively large, higher quality program, to over $1 billion in the large states of California, Florida, and New York. Figure 8 maps the savings project by 2030 across the United States.

Policy makers and the public should consider all the evidence when evaluating proposals to expand access to quality pre-K and other early education programs. They should not be dissuaded by the many red herrings that will be drawn across this path to greater school readiness and success. Sure, some at-risk children will succeed without access to high quality preschool. We have all heard stories of people who smoked their whole lives and never developed cancer or emphysema; who were thrown from a car while not wearing a seat belt and suffered no injury; who dropped out of school and went on to great success; and, who took a long shot from half-court to score the winning basket. We also all know better than to think these stories are a guide to success in our personal lives or basketball. Policy makers need to apply the same type of good sense to pre-K and take the high percentage shot. Invest in policies that enable all children, especially those in low-income families, to access quality pre-K.

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Table 1. State and Local Pre-K Effect size at End of Pre-K or Beginning of Kindergarten

Reference	State	Year	Learning outcome		
			Math	Language	Literacy
Jung, et al.(2013)	Arkansas	end of pre-k	.27	.28	1.00
Weiland & Yoshikawa (2013)	Boston	K	.59	.44	.62
Barnett, et al.(2013)	California	end of pre-k	.34	.39	1.19
Reynolds, Temple, & Ou (2010)	Chicago	K	.35	.21	
King, Cappellini, & Rohanie (1995)	Florida(*)	K	.25	.23	
Peisner-Feinberg, Schaaf, & LaForett (2013)	Georgia	end of pre-k	.18	.06	.14
Wong et al. (2008)	Michigan	K	.47	-.13	.96
Barnett, Lamy, & Jung (2005)	Michigan	K	.44	.21	.96
Florian, Schweinhart, & Epstein (1997)	Michigan	K	.51	.45	
Peisner-Feinber & Shaaf, 2008	North Carolina	end of pre-k	.30	.19	.21
Peisner-Feinberg & Schaaf (2011)	North Carolina	K	.07	.27	.93
Wong et al. (2008)	New Jersey	K	.23	.36	.50
Frede, Jung, Barnett, & Figueras (2009)	New Jersey	K	.13-one year .29-two years	.22-one year .41-two years	.11-one year .14-two years
Barnett et al.(2013)	Oklahoma	end of pre-k	.51	.32	.71
Wong et al. (2008)	Oklahoma	K	.34	.29	.42
Gormley et al. (2008)	Tulsa, OK	K	.36		.99
Barnett et al.(2013)	South Carolina	end of pre-k		.05	.78
Wong et al. (2008)	South Carolina	K		.04	.79
Lipsey, Hofer, Dong, Faran, & Bilbrey (2013)	Tennessee	end of pre-k	.32	.31	.46
Lipsey, Hofer, Dong, Faran, & Bilbrey (2013)	Tennessee	K	.02	-.09	.04
Barnett et al. (2013)	West Virginia	end of pre-k	.13	.15	.71
Wong et al. (2008)	West Virginia	K	.06	.16	.92
Magnuson, Ruhm, & Waldfogel (2004)	National representative sample	K	.40	.73	

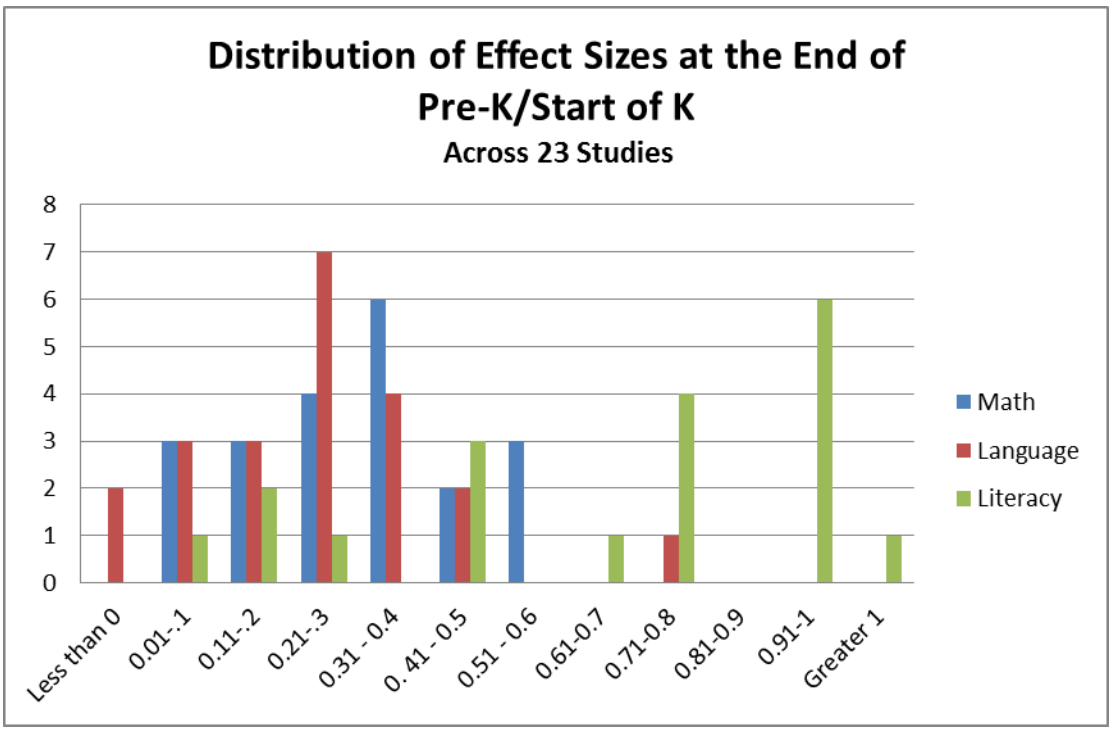

Figure 1: Distribution of Effect Sizes at the End of Pre-K/Start of K, Across 23 Studies

Table 2.State and Local Pre-K Effect Sizes in 1st Grade and Beyond

Reference	State	Year	Learning outcome	
			Math	Language/Literacy
Lipsey, Hofer, Dong, Faran, & Bilbrey, (2013)	Tennessee	1st grade	-0.05	-0.01
Magnuson, Ruhm, & Waldfogel (2007)	National representative sample	1st grade	0.05	0.03
Frede, Jung, Barnett, & Figueras (2009)	New Jersey	1st & 2nd grade (avg)	0.21	0.185
Pilcher & Kaufman-McMurrain (1996)	Georgia	1st grade		0.24
Kuhne (2008)	Texas	3rd - 6th grade	0.03	0.0375
Magnuson, Ruhm, & Waldfogel (2007)	National representative sample	3rd grade	0.07	0.06
Texas Education Agency (1995)	Texas	3rd grade	0.09	0.08
Peisner-Feinber & Shaaf (2010)	North Carolina	3rd grade	0.12	0.14
Hill, Gormley, & Adelstein, (2012)	Tulsa, OK	3rd grade	0.18	0.09
Ladd, Muschkin, & Dodge (2012)	North Carolina	3rd grade	0.24	0.17
Reynolds (2000)	Chicago	3rd-6th grade (avg)	0.25	0.26
Barnett, Jung, Youn, & Frede, (2013)	New Jersey	4th & 5th grade (avg)	0.155	0.15
Fitzpatrick (2008)	Georgia	4th grade	0.025	0.025
Bartik (2013)	Georgia	4th grade	0.19	0.19
Kuhne (2008)	Texas	7th - 8th grade	0.01	0.02
Cascio &Schanzenbach (2013)	Georgia/Oklahoma	8th grade	0.063	NS[b]
Reynolds (2000)	Chicago	8th grade	0.17	0.18

a. The effect size was recalculated based on the result of Fitzpatrick (2008)
b. Effect size was not statistically significant and was not reported.

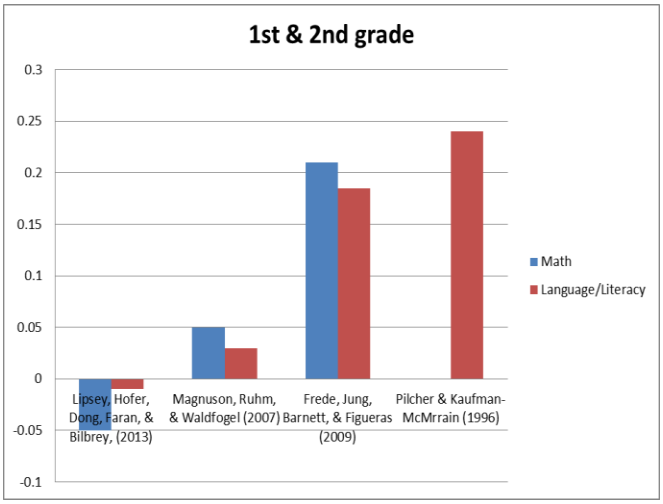

Figure 2: State and Local Pre-K Effect Sizes in 1st & 2nd Grade

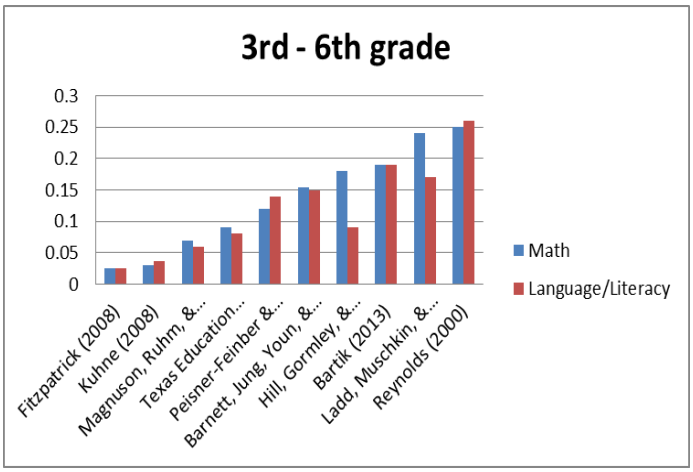

Figure 3: State and Local Pre-K Effect Sizes in 3rd - 6th grade

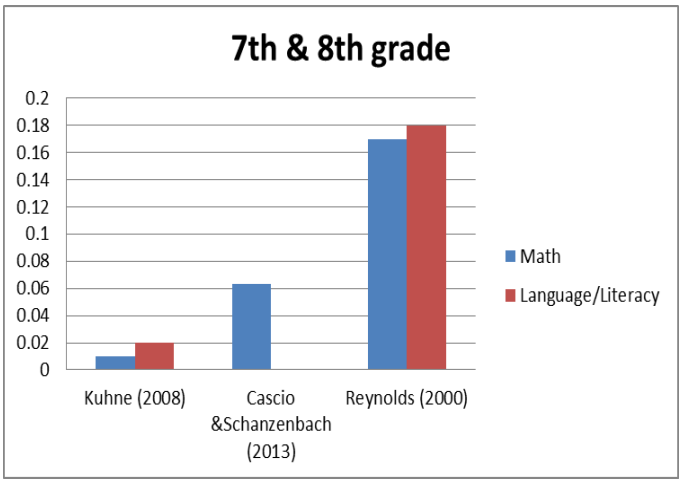

Figure 4: State and Local Pre-K Effect Sizes in 7th & 8th grade

Table 3. Achievement Gains in Head Start FACES Studies by Age and Ethnicity: 2003-09

	2003		2006		2009	
Language	PPVT-3		PPVT-4		PPVT-4	
	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4
White	2.052	1.712	1.688	3.442	2.748	3.351
Black	0.946	1.659	0.967	3.488	2.561	4.315
Hispanic	3.545	5.857	4.344	6.582	6.239	8.723
Literacy	WJ-LW-3		WJ-LW-Revised		WJ-LW-Revised	
	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4
White	1.514	3.426	4.568	5.095	6.826	4.305
Black	3.088	4.606	8.585	5.689	7.508	4.802
Hispanic	1.697	3.705	6.298	5.122	6.802	5.265
Math	WJ-AP-3		WJ-AP-Revised		WJ-AP-Revised	
	Age 3	Age 4	Age 3	Age 4	Age 3	Age 4
White	4.786	4.153	0.887	8.053	2.615	1.371
Black	3.519	2.604	0.323	3.034	1.621	0.576
Hispanic	5.7	2.456	-.441	3.256	3.083	4.152

NIEER calculations from FACES 2003, 2006, 2009 data.

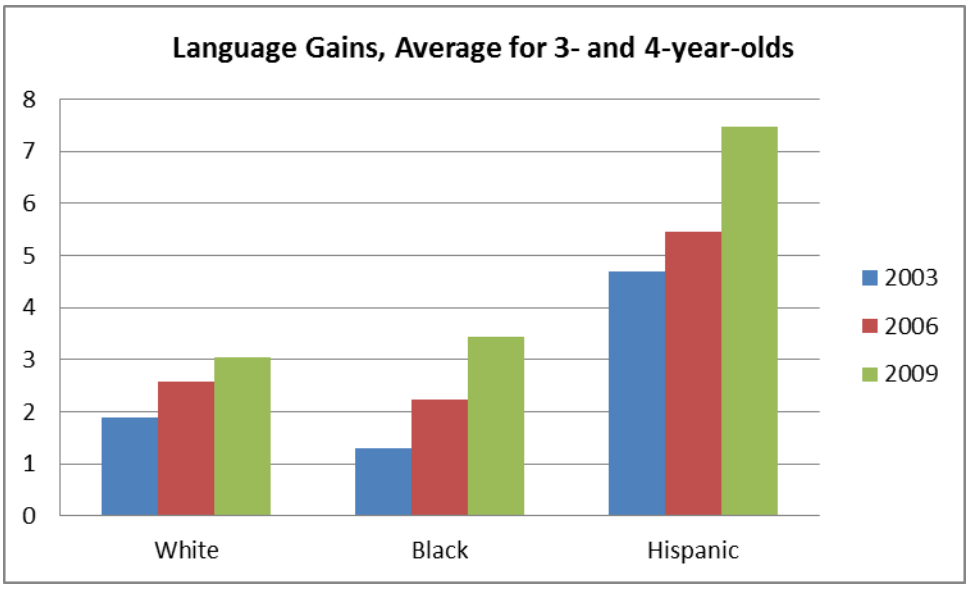

Figure 5: Language Gains in Head Start FACE Studies, Average for 3- and 4-year-olds

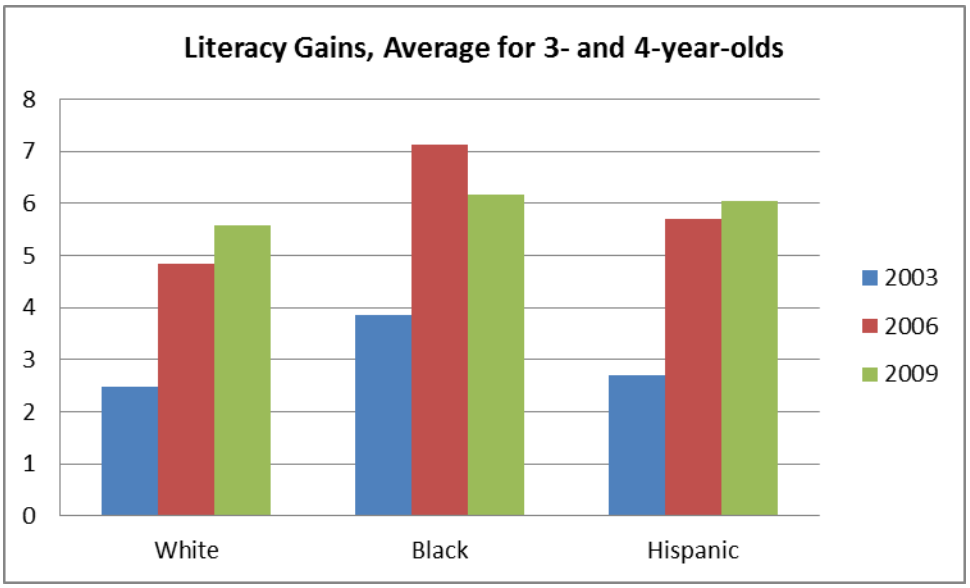

Figure 6: Literacy Gains in Head Start FACE Studies, Average for 3- and 4-year-olds

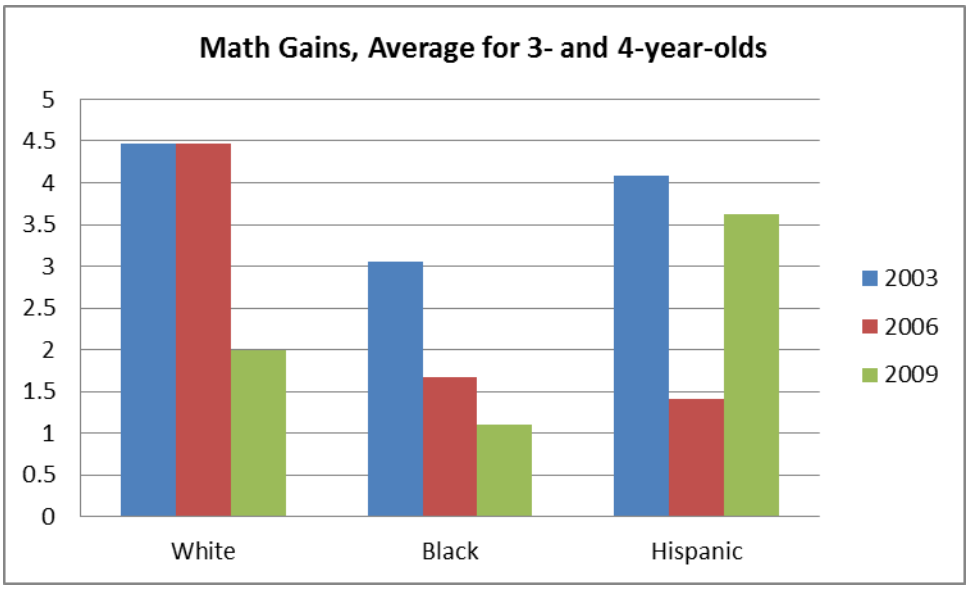

Figure 7: Math Gains in Head Start FACE Studies, Average for 3- and 4-year-olds

Table 4. Budgetary Impact of Providing Quality Pre-K to All Children Under 200% FPL by State

State	Net Effect on P-12 Spending		State	Net Effect on P-12 Spending
AL*	-470,692,301		MT***	-34,570,050
AK	-161,520,118		NE	-111,696,399
AZ	-319,434,680		NV*	-208,184,995
AR	-26,672,819		NH***	-157,044,124
CA	-1,197,043,751		NJ**	-854,522,954
CO	-161,597,162		NM*	-101,551,650
CT	-327,046,665		NY*	-1,788,631,804
DE	-83,783,090		NC	-576,839,717
FL*	-1,251,967,809		ND***	-28,982,888
GA*	-208,005,379		OH	-829,760,621
HI***	-53,693,939		OK*	-35,828,928
ID***	8,507,601		OR	-346,072,972
IL*	-641,409,465		PA**	-1,130,479,788
IN***	-292,168,007		RI*	-126,055,097
IA**	-93,943,117		SC	-110,636,977
KS	-144,326,556		SD***	-31,062,091
KY	-85,334,506		TN	-242,504,435
LA**	-247,849,417		TX	-1,711,819,395
ME*	-122,111,305		UT***	-72,416,132
MD	-313,336,050		VT**	-39,080,933
MA	-676,030,993		VA*	-607,613,290
MI	-470,585,414		WA	-494,402,606
MN	-594,734,060		WV*	-48,321,308
MS***	-48,804,427		WI**	-112,896,655
MO*	-248,270,476		WY***	-55,478,679

No star: Means-tested program
* Open to all regardless of income
** Mixed programs (Means-tested and non-means-tested)
*** No program in 2013

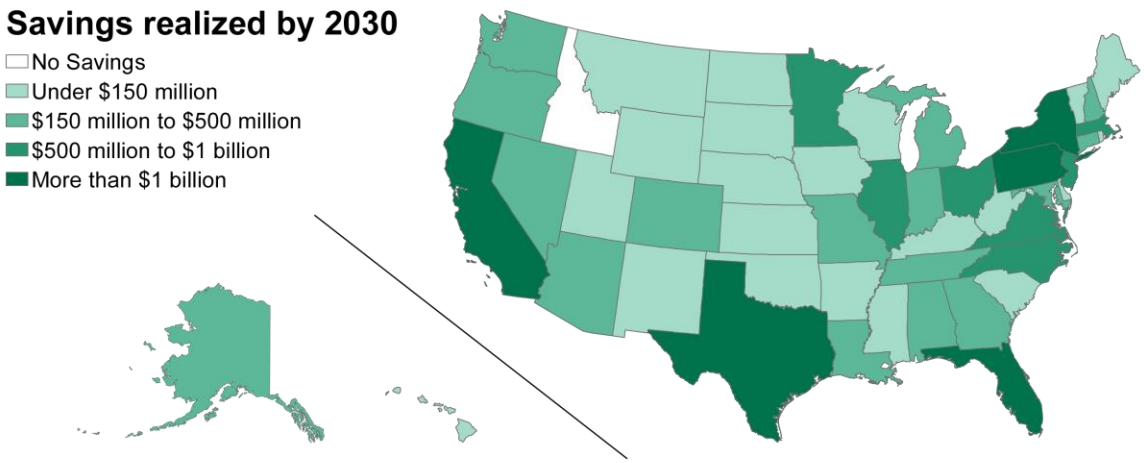

Figure 8: Budgetary Impact of Providing Quality Pre-K to All Children Under 200% FPL by State