



# UNIVERSAL PRESCHOOL

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## **Abstract**

This study compares how universally funded preschool programs compare to traditionally funded preschools. This will be done by comparing the effect of a switch to a universal model on fourth grade standardized reading tests. The results of the study are largely insignificant. These results could be influenced by the limitations discussed in the conclusion of the paper. While the topic of universal preschool has many policy applications, none can be recommended based on these results.

## **Introduction**

In order to maximize the human capital of a worker, one key factor is educational attainment. The Becker model cites education, as well as work experience, as the factors that impact wages. The quantity of education received, as well as the quality of the education, are important for the outlook of a child (Heckman). Pre-k education offers an earlier start on the development of children in the academic sphere, making them more prepared to attend school. It provides additional opportunity for children to succeed that might be lost by children being unable to attend.

Throughout the country, pre-kindergarten education is funded differently than the traditional kindergarten through twelfth grade educational track. Since pre-K education is not compulsory in the way that the traditional educational track is, a majority of states will provide some funding to supplement the limited federal funding being provided through the Head Start Program that constitutes a bulk of the funding. Most states do not allocate enough funding in state budgets to allow for free access to all children within the appropriate age bracket. However, three states – e.g. Florida, Washington

and Vermont, as well as Washington D.C., have funded truly universal preschool programs. This means that they are allowed uncapped and flexible funding to meet enrollment demand. Seven other states, Oklahoma, West Virginia, Georgia, Illinois, Iowa, New York, and Wisconsin have nearly universal preschool programs across most districts. As of the 2016-2017 school year, six states, Idaho, Montana, New Hampshire, Wyoming, and North and South Dakota did not provide any state funding to pre-K programs, according to the Education Commission of the States. It is important to note that while these preschool programs are universally available, it is not mandatory to attend them in the same way that a traditional K-12 school might be. However, the Education Commission of the States does note that these programs do see high enrollment rates.

The discussion around reform to the United States preschool program is a growing part of the American political dialogue. With the presidential election coming in 2020, education is presenting itself as a key issue. The two wings that many, particularly on the left, are discussing are student loan forgiveness and also, universally available, high quality, preschool education. Democratic candidate Julián Castro included universal preschool in his platform. He notes the success of the universal preschool program in San Antonio, which went into place while he was mayor. It received funding from a slight one-eighth cent sales tax increase.

Democratic candidate Senator Elizabeth Warren also is running on platform of universal preschool claiming benefit in education, as well as additional affordable childcare. To back up her platform, she is bringing forth a bill proposing a \$700 billion early childhood education program.

Democratic candidate Senator Kamela Harris also has promised universal preschool as a part of the education reform that makes up her platform. However, at this time she does not have any proposed specific plan.

This study will analyze how universal preschool programs compare to those from state capped funding public preschool programs in regard to fourth grade reading tests. This provides a different bench mark than previous studies that have been conducted using math scores. If state universal program is found to be effective in increasing test scores, this study will provide some additional evidence for policy makers to potentially reform the way preschool education is funded throughout most of the country.

### **Literature Review**

The Perry Preschool Program is broadly cited regarding the economic benefit of preschool programs. It was found to have a variety of benefits particularly among boys, disadvantaged families, and African Americans (Rolnick and Grunewald 2003). These observed benefits have been used to argue for the expansion of universal style programs. Perry Preschool participants were less likely to be in a special education program and had higher achievement scores at the age of 14.

The paper by Heckman, Moon, Pinto, Savelyev, and Yavitz (2009) re-evaluated these results found in the original study reported by Rolnick and Grunewald in 2003. They found some issues with the randomization methods of the program design which may have introduced some sample selection bias in the original study. Moreover, Rolnick and Grunewald 2003 failed to report standard errors which raised some question regarding the statistical significance of the found effects. This paper improves

upon the models for previous estimates and finds a 7-10% decrease from the originally reported benefits but still concluded that the Perry Preschool Program was a beneficial investment. Because of the conservative approach to estimates, this paper claims that they likely provide a lower bound to rates of return for the Perry Preschool Program.

In a recent study, Cascio and Whitmore (2013) looked at the effect of expanding public access to preschool in Oklahoma and Georgia compared to the rest of the country. Oklahoma's and Georgia's legislator moved to a universal pre-k program in ... They conducted a cost-benefit analysis to ascertain the impacts of these model programs and their impacts on various outcomes for the child and the family. They found that the children's test scores were higher in both fourth and eighth grade, particularly in the field of math. They also found that mothers were more likely to work because of childcare provided, as well as they spent more time with their children doing developmental activities like reading together.

One point of contention regarding the idea of expanding universal preschool programs is the costs associated with doing so. In the paper by Powell and Cosgrove (1992), they estimate the cost function associated with providing quality early childhood education. They use full time equivalent (FTE) children as an output of preschool. They compare the factor costs associated with teachers, aides, buildings, and other necessary supplies, while also controlling for variations in quality because higher quality preschools are more likely to cost more. They found that lowering the ratio of children to staff members by one student per staff member saw an increase in costs by 4.5%. They also found an importance of keeping educator turnover low to minimize costs, as well as modest economies of scale.

Another potential point of contention is the idea that universal funding for public preschool education will still be unable to provide the same level of quality education that private preschools can provide. Availability of quality programs is a potential issue for children. Kearney and Levine (2019) looked into potential substitutes for traditional preschool. The aim of their study was to determine if children exposed to *Sesame Street* in 1969 saw educational and labor market benefits. They found a notable increase in test scores in controlled trials, as well as large scale generational improvements when broadcasts of *Sesame Street* became wide spread. They found the highest benefits with boys, African Americans, and disadvantaged children. They concluded that *Sesame Street* was able to achieve these outcomes at a cost of approximately a modern equivalent of \$5 per child.

Garcia, Heckman, Leaf, and Prados (2019) seek to measure the long term outcomes of preschool programs based on a pair of programs from North Carolina. These benefits are assessed in terms of academic achievement of participants and post academic wellbeing up until the age of 30. They also computed the impact of preschool on other aspects such as health and likelihood of committing a crime. Their estimates indicate an 8-18.3% rate of return for these programs, supporting the social profitability of the programs in North Carolina. They do note, however, that these programs are targeted to disadvantaged children in a predominantly African American community. This may present issues when an attempt is made to generalize results.

In summation, the literature largely points in the direction of benefits being provided by early childhood education. Children show immediate benefits as well as

positive long-term outcomes. It provides basis for the notion that expanding early childhood education to having universal availability would see even more benefit.

## **Design**

This study seeks to compare how states with universal programs or nearly universal programs compare to capped funding states and states that do not provide any funding for pre-K12 education. The universal states and nearly universal states will constitute the treatment group, while the rest of the available states will constitute the control group. Because of the available years, the states that make up the treatment group are Florida, Iowa, Illinois, and Washington D.C. New York, Oklahoma, Washington, and Wisconsin had to be omitted from the study, and the remaining forty-three states make up the control group. The metric being used to compare the states is scores on fourth grade standardized reading tests. Reading scores were chosen because of an importance on literacy for students continued academic success. This data, from the National Assessment of Education Progress, is broken in categories of below basic, at or above basic, at or above proficient, and at advanced. For the purposes of this study, those groups are categorized as below, basic plus, proficient plus and advanced. This is because without such grouping it is impossible to tell whether the middle groups are being populated by the lower groups rising, or the higher groups falling. The universal states should provide a higher level of advanced, proficient plus, and basic plus students and reduce the level below basic.

The year that the states made the transition to universal is found from an amalgamation of government documents and news articles.

## Variables

Variable	Description	Source
Post	Whether school has switched to universal system	Various news and government sources
Below, basic_plus, proficient_plus, advanced	Percentage of students in each performance bracket	NAEP
D(state name)	Dummy variable for each of the states	created
D(year)	Dummy variable for each applicable year	created

## Empirical Model

The model will look at the following years: 2009, 2011, 2013, and 2015. The regressions appear as such, [Test score bracket =  $\beta_0 + \beta_1 \text{post} + \beta_2 \text{state\_dummies} + \beta_3 \text{year\_dummies} + \epsilon$ ] This model is a combination of a difference in difference model and a fixed effect model. Post measures the transition before and after the switch to universal in applicable states. The year and state dummy variables were to keep the effects of the those to variables fixed. New York, Oklahoma, Washington, and Wisconsin all had to be excluded due to limitations of data for certain years that would otherwise include them in the treatment group. One state and one year were omitted as control.



## Analysis

Figure 1

Variable	Below	Basic_plu s	Proficient_plu s	Advanced
Intercept	33.63188	66.32367	30.844	6.18554
post	-0.16332	0.50406	0.02197	-1.22565
y2011	-0.32936	0.32195	0.77048	0.28165
y2013	-1.40894	1.40154	2.39767**	0.90374**
y2015	-2.5345**	2.52709**	3.79886***	1.40954***
dalaska	8.96972***	-8.91972***	-5.02884**	-1.26017
darizona	8.32012***	-8.27012***	-5.49147**	-1.13155
darkansas	3.2224	-3.1724	-2.21389	-0.72415
dcalifornia	10.56018** *	10.51018** *	-6.78991***	-1.1218
dcolorado	-4.51343	4.56343	7.00475***	3.19372***
dconnecticut	-7.24189**	7.54189***	10.16273***	5.30427***
ddelaware	-4.51116	4.56116	3.97823	1.32818
dwashingtondc	14.61658** *	-14.56658	-7.20885***	0.87984
dflorida	-1.39113	1.19113	1.65645	1.32254
dgeorgia	-0.31285	0.11285	0.84824	0.77708
dhawaii	6.0297**	-6.2297**	-3.68203	-0.45138
didaho	0.92423	-0.87423	-0.86151	-0.46414
dillinois	1.7012	-1.65675	1.41431	2.41772
dindiana	-2.34723	2.39723	2.23525	0.87688
diowa	-3.60541	3.65541	3.75764	1.00259
dkansas	-3.81836	4.11836	4.10646	1.23226
dkentucky	0	0	0	0
dlouisiana	7.89898***	-8.09898***	-6.6051***	-1.81687**
dmaine	-1.20562	1.50562	0.85194	0.38737
dmaryland	-5.77654**	6.07654**	7.63649***	4.89138***
dmassachusetts	-9.97454***	10.02454	12.94081***	6.33506***
dmichigan	-1.46709	1.26709	2.51841	1.4773
dmissouri	0.77874	-0.72874	0.12923	0.47344
dmontana	-4.15687	4.20687	2.92508	0.73046

<b>dnebraska</b>	-3.36703	3.41703	3.71403	1.19817
<b>dnevada</b>	4.63156	-4.83156*	-3.62323	-0.99447
<b>dnewhampshire</b>	-6.53324**	6.58324***	6.97464***	2.17513**
<b>dnewjersey</b>	-9.61089***	9.66089***	10.42932***	4.44324***
<b>dnewmexico</b>	9.22739***	-8.92739***	-6.36068***	-1.1054
<b>dnorthcarolina</b>	-0.16135	0.46135	1.69655	1.20495
<b>dohio</b>	-4.05432	4.10432	3.37592	0.96642
<b>doregon</b>	1.18711	-1.13711	-0.66394	0.23327
<b>dpennsylvania</b>	-3.4964	3.5464	5.44182**	2.77775***
<b>drhodeisland</b>	-3.36557	3.41557	4.98657**	2.32097**
<b>dsouthcarolina</b>	3.532	-3.482	-1.5549	0.16759
<b>dsouthdakota</b>	0.19138	-0.39138	-0.28514	-0.29599
<b>dtennessee</b>	2.85603	-2.80603	-1.964	-0.40631
<b>dtexas</b>	3.13878	-3.08878	-2.98829	-0.37728
<b>dutah</b>	-0.01482	0.06482	0.51595	0.01323
<b>dvermont</b>	-6.84184	7.14184**	8.86563***	4.31944***
<b>dvirginia</b>	-6.5675**	6.3675**	8.61909***	4.24342***
<b>dwyoming</b>	-5.76724**	6.06724**	3.94261	0.30803
<b>R-squared</b>	0.5893	0.596	0.6197	0.6362
<b>Number of Observations</b>	184	184	184	184

**Figure One** shows the results of the results of the model. One, two, or three stars following the coefficient denotes statistical significance at the ninety, ninety-five, and ninety-nine percent levels, respectively. The state and year variables were mixed both positively and negatively among the significant instances. This is likely due to variance among the states across time. The primary variable which this study is concerned about is the post variable. In each bracket of test scores, the post variable was very insignificant.

The below coefficient was correctly predicted as negative and the basic\_plus and proficient\_plus coefficients were correctly predicted as positive. The advanced coefficient was incorrectly predicted as positive but in fact was negative. However, these coefficients really cannot provide any story as to the relationship between these

fourth-grade standardized reading test scores and the universal preschool status because of how insignificant the post variable is in each model. These results call into question the usefulness of the reading test as a metric, as statically significant results were seen with math tests in the literature. There is also potential that further control variables are required to improve the results that were not included in this study.

## **Conclusions**

With the insignificance level of the post variable across all four models at the point that it is, there is limited explanatory value in these models. The effect of universal preschool could potentially go uncaptured by the fourth-grade standardized reading test scores. These benefits could instead be teaching these young children the skills they need to learn and be successful in school or could be in another subject area. Another unobserved potential benefit could be in the ability to provide guaranteed affordable childcare. This could potentially lessen costs on families that currently have to pay for childcare, and it could allow stay at home parents to re-enter the workforce in some capacity.

Because of the variety of potential benefits that could be going unseen by this study, it is unsound to render judgement on universal preschool as a policy idea. While the results in the study do not lead to recommending universal preschool at the widespread level, in actuality, the total benefit is unknown. There could be another factor that justifies the cost of a large-scale program.

There are a variety of limitations relevant to this study. Chief among them is data availability. Some universal states were excluded because the standardized reading test

scores did not date far enough back to include them in the treatment group. Others had to be excluded because they made the switch too recently and the first class of “universal students” would not yet have reached fourth grade to take the standardized reading test.

The study would also benefit from a proxy for quality. This study was unable to produce a useful proxy with the data that was obtained but variance across states in the quality of programs is possibly affecting scores. It is also possible that the availability of preschool is less important than the quality of preschool. Not only is the quality of preschool important, but also the quality of the elementary schools.

Similarly, the study could use some sort of proxy for the benefit added by childcare. As previously discussed, the benefits to universal preschool could be presented to parents instead of solely to students.

The scope of the study is also a limitation. The fourth grade reading score as a measure does not provide a long term outlook on the benefits. It is possible that the benefit could show later in life with benefits to soft skills or results as the student ages. Some literature measures adult benefits, such as reduction in crime, which fall outside the scope of this study.

Future studies would benefit from attempting to address these limitations in some way. They also would be prudent to allow for the passage of more time to add further states to the treatment group or switch to a different measure that allows for the inclusion of more universal states in the treatment group.

## References

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