



## **Why Expanding New Mexico State Pre-K Won't Help the Children Who Need Help the Most**

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July 2020

As the inaugural cohort of 1,540 pre-K students completed their 14th year of school this past spring, the New Mexico's Legislative Finance Committee (LFC) released a report on the state's pre-K program, concluding that "prekindergarten remains a cost-effective way to improve student outcomes."<sup>1</sup> But the data the report cites does not support that conclusion. Indeed, the LFC makes three errors in interpreting the research it describes: mistaking correlation for causation, confusing statistical significance with real-world significance, and misusing the concept of cost-effectiveness.

### **Correlation vs. Causation**

The biggest error the report makes is a common one. Like many similar studies, the LFC report describes a correlation between attending pre-K and marginally better school outcomes down the line, assuming that attending pre-K caused those better outcomes. But the research reported shows us only that attending pre-K is *correlated* with school outcomes. It does not tell us that pre-K caused anything.

Basic statistics explains that a correlation between two variables does not necessarily mean that one caused the other. A causal relationship may exist, but that is only one of three explanations for a correlation. Variables can be also be correlated by chance—for instance, from 1999 to 2009, the number of bicyclists killed in a collision with a stationary object was directly correlated with the number of people who died by falling from a ladder.<sup>2</sup> Those two variables were closely correlated for a decade, but no causal relationship between them exists.

The final possibility is that a correlation between two variables is neither causal nor chance, but explained by an unmeasured, unaccounted-for, third variable. For example, the more fire engines called to a fire, the greater damage the fire does. That does not mean fire engines cause fire damage, however; rather, a third factor—the size of the fire—both causes how many fire engines are called and how much fire damage occurs. Similarly, increased ice cream sales are correlated with increased air conditioner purchases. Eating ice cream does not cause people to buy air conditioners. A third factor, not visible in the correlation between ice cream and air conditioner sales—hot summer weather—both causes people to eat more ice cream and to buy more air conditioners.

The best explanation for a correlation between pre-K and school outcomes falls into this final category: A third factor, not visible or accounted for in the research data, is causing both. In the case of the relationship between pre-K and school performance, that third factor is children's parents.

**The Crucial Role of Parents.** Unlike all subsequent school grades, pre-K attendance is voluntary. That means only children with engaged and motivated parents are in pre-K in the first place: parents who go out of their way to find a pre-K program, enroll their children in it, and get them there every day. In other words, the very fact that a child is attending pre-K reflects what decades of research have shown to be most powerful factor shaping children's outcomes: parenting quality and parents' engagement in their child's education.

On the other hand, parents who care less about education or those who are less capable or more stressed—e.g. neglectful, depressed, drug addicted, or working multiple jobs—are much less likely to enroll their child in pre-K and ensure the child's regular attendance throughout an entire school year. Children of these parents are also less likely to perform well in school—not because they didn't go to pre-K, but because of the kind of parents they have.

The bottom line is that children who experience high-quality, engaged parenting are more likely to do better in school, with pre-K or without it. As an illustration of this, imagine the owner of an expensive restaurant claiming that eating at his restaurant causes people to be richer, based on a study showing that people who patronized the restaurant five years ago are now wealthier than those who did not. It's unlikely that eating at his restaurant *caused* people to be wealthier; instead, people eating at an expensive restaurant were probably more likely to be wealthy in the first place.

The restaurant example may be easier to grasp, but it's exactly the same as the claim made about pre-K: Just as people who are already wealthier are more likely to eat at an expensive restaurant, children whose parents are more capable and engaged in their child's education are more likely to attend pre-K. Wealthier people at one point in time are more likely to be wealthier years later. Similarly, parents who are capable and engaged enough in their child's education to voluntarily send their 4-year-old to school are more likely to be more capable and engaged throughout their child's schooling.

The data the LFC report interprets as showing the average “effects” of pre-K is thus actually showing the average effects of *parenting*. The children who attended pre-K were more likely to do better in school whether they went to pre-K or not. In other words, pre-K did not cause better outcomes for these children; it predicted them.

The influence of a child’s parents far outweighs a single year of school—whether that year is pre-K or kindergarten or fifth grade. And pre-K does not cause good parenting; it simply tells us what kind of parents that children already have. Comparing children who attend pre-K to those who don’t is therefore an apples-to-oranges comparison, because parents who put their children in pre-K are critically different from the parents who do not.

**Rigorous, Randomized Studies of Pre-K Programs.** The only way to determine if pre-K itself causes better outcomes is to conduct a randomized study enabling an apples-to-apples comparison: designed so the sole difference between children is that they attended pre-K or did not. Just two such randomized studies of scaled-up preschool programs have been done—one on the Tennessee state pre-K program and one on Head Start—and both suggest that parents, not pre-K, are the cause of better school performance.

*Tennessee Pre-K Study.* In Tennessee, researchers from Vanderbilt University investigated the effects of pre-K by following a large group of children, some of whom attended Tennessee’s state pre-K program and some of whom did not.<sup>3</sup> Unlike the recent LFC report, however, the Tennessee study did not compare children whose parents made an effort to get them into pre-K with children whose parents did not. Rather, *all* the parents of the children studied were trying to get them into pre-K, meaning that all demonstrated a similar level of motivation and engagement in their child’s education at the outset of the study.

The Tennessee researchers began with a group of almost 3,000 children whose parents had applied to Tennessee’s high-quality, state pre-K program, which only had about 2,000 spaces. The researchers randomly admitted about two-thirds of the children into the available spaces, while one third were denied admission. They subsequently tracked the performance of the entire group of children (both those who had been allowed into the program and those who had not) through third grade.

At the end of the pre-K year, the researchers found that children who had attended the pre-K program performed better on multiple achievement tests than those who had not attended. But over the kindergarten year, the children who had *not* been admitted to the pre-K program caught up to the pre-K participants. On state achievement tests in 2nd and 3rd grade, the children who had not attended pre-K actually outperformed the children who had attended. Furthermore, the pre-K participants had more disciplinary problems and special education placements by 3rd grade than non-participants. The researchers found no difference in attendance or grade retention between the two groups.

*Head Start Study.* The second randomized study of a large-scale preschool program was conducted on the federal Head Start program.<sup>4</sup> The study followed a national group of 5,000 four-year-olds, all of whose parents had sought entry into Head Start. Similar to the Tennessee study, some children from this group were randomly accepted while others were denied admission into the program.

The Head Start study, too, found that by the end of the program year, the children who attended Head Start had made greater gains than nonattending children on some achievement measures. As in the Tennessee study, however, by the end of kindergarten the children who had not attended Head Start had caught up on most achievement outcomes. For the subsequent grades, the children who had *not* attended Head Start did the same or better than the children who had participated in the program.

If the researchers in the Tennessee and Head Start studies had compared children who attended the preschool program with those whose parents had never tried to enroll them, they may well have found that those who attended preschool had better school outcomes. But both of these studies compared two groups of children who all had parents sufficiently motivated and engaged to seek their child’s enrollment in pre-K. And both found that the preschool program itself had no impact—or even a negative effect—on children’s later outcomes.

The bottom line of these findings is that the kind of parents children have—not starting school when they’re four instead of five—is the primary influence on their school performance. That is, parents who make the effort to get their child into a voluntary preschool program in the first place have demonstrated an exceptional concern for their child’s education, the effects of which extend throughout their child’s schooling.

### **Statistical vs. Real Life Significance**

The second error the LFC report makes is failing to distinguish between statistical significance and significance in real life. The improvement in achievement outcomes the report cites for children who attended pre-K, are described as statistically “significant” but, in practice, are essentially meaningless.

**School Achievement.** Across the six kindergarten-entry readiness domains measured, the children who had attended pre-K in 2018 scored just barely higher than those who had not—a couple of percentage points at most. Both groups scored around 80 percent in “physical development, health, and well-being,” 70 percent in “approaches to learning” and “self, family, and community,” a little under 70 percent in “scientific conceptual understandings,” and just around 60 percent in literacy and mathematics.

Differences in 3rd grade PARCC proficiencies, too, were virtually imperceptible. Almost three-quarters of *both* the pre-K and non-pre-K groups failed to meet third grade PARCC proficiency in English: 70.3 percent of children who had attended pre-K failed to meet

proficiency standards compared to 71.9 percent of children who had not. Roughly two-thirds of both groups failed to meet proficiency standards in math: 65.9 percent of the pre-K group compared to 68.1 percent of the non-pre-K group.

Indeed, if pre-K were making a substantial impact on children's academic competence, we would expect New Mexico's National Assessment of Education Progress (NAEP) scores to rise as the percentage of the state's children attending pre-K increased. From 2011 to 2019, however, while the percentage of fourth graders who had attended pre-K almost tripled, the percentage scoring at or above Basic on the NAEP reading exam remained exactly the same at 53 percent. In math, that percentage actually declined from 75 to 72 percent. These data are in fact echoed by a national 2018 Brookings Institution study, which also found no association between levels of enrollment in a state's pre-K program and the state's NAEP scores five years later when pre-K attendees reached fourth grade.<sup>5</sup>

**Attendance and High School Graduation.** The largest outcome differences the LFC report describes between the pre-K and non-pre-K groups were for school attendance and rates of high school graduation within four years. The report found no difference in attendance rates between the pre-K and non-pre-K groups. However, 16 percent of non-pre-K students were chronically absent (defined as an average attendance rate below 90 percent) compared with 12 percent of students who had attended pre-K. This is hardly surprising, though, and unlikely to be caused by attending pre-K.

Parents who go out of their way to voluntarily send their 4-year-old to school for an entire year seem considerably more likely to ensure their child continues to attend school from kindergarten on. Conversely, parents who do *not* voluntarily send their 4-year-old to pre-K seem less likely, on average, to make sure their child attends school once they start kindergarten. In other words, pre-K selects for exactly the parents most likely to ensure their children's consistent attendance throughout the rest of their schooling.

The report also emphasizes higher four-year rates of high school graduation among the pre-K group: 80 percent of the 1,540 students in New Mexico pre-K's inaugural cohort graduated within four years compared to 74 percent of the roughly 25,000 students who had not attended the pre-K program 14 years prior. As with attendance, parents who are focused enough on their children's education to voluntarily send them to school at age four are probably also more likely to push those same children to graduate on time when they reach high school.

### **Cost-Effectiveness**

The report's third error is misusing the concept of "cost effectiveness." It concludes that pre-K is a "cost effective" expenditure of taxpayer dollars. But compared to what? Leaving aside questionable findings on pre-K outcomes, discussed above, the report's conclusion reflects an apparent misunderstanding of how cost effectiveness analysis is used in a policy context.

In public policy, cost effectiveness does not mean showing that the benefit of an intervention outweighs the cost. It means comparing various interventions to determine which ones yield the greatest benefit for resources spent to accomplish a particular policy goal. In other words, the central issue for policy is not whether a case can be made that the financial value of program X's outcomes is greater than its cost. The essential policy question is how to achieve the *maximum benefit possible* for expenditure of limited public resources.

Responsible spending decisions can therefore only be made by assessing alternatives. It is impossible to decide whether to spend \$100 on Program A with only the information that it yields an eventual benefit of \$108. How does \$108 compare to the benefit yielded by other expenditures of \$100 towards the same policy goal? If Program B also costs \$100 but yields an eventual benefit of \$120, Program A is an ineffective—indeed, irresponsible—use of public resources.

In the case of pre-K, asking whether sending 4-year-olds to school is a good idea is therefore the wrong question. The correct question is: What is the most effective use of limited resources to raise New Mexico's school performance and improve the life trajectories of the state's children? The outcomes the LFC report describes, even assuming they were caused by pre-K, are a very low payoff for a yearlong, \$7,000 investment per child. Especially given the dismal achievement of both pre-K participants and non-participants alike, expanding pre-K seems more along the lines of a cost-effective way to rearrange deck chairs on the Titanic.

In 2019, New Mexico spent over \$60 million on pre-K. If the goal is advancing the well-being of the state's most disadvantaged children, the question New Mexico policymakers should be asking is how best to use \$60 million a year towards accomplishing that goal. Based on all currently available data, it's very hard to see how the answer to that question is "pre-K."

In fact, an LFC report from just a couple of years ago found large, meaningful improvements through school-based approaches other than adding a 14th grade to the New Mexico public schools.<sup>6</sup> In particular—and as common sense might suggest—the report identified teacher quality as having the "most impact on a student's academic achievement" of all school-related factors.

As the 2017 LFC report described, the positive effects of improving children's teachers were orders of magnitude larger than those associated with attending pre-K. For example, children's math and reading PARCC scores varied by up to 49 percentage points over three years, depending on whether they had effective or ineffective teachers over that period. Similarly, low-performing schools that participated in the "Teachers Pursuing Excellence" peer mentoring program increased the percentage of students scoring at or above proficient on the PARCC exam from 24 to 35 percent in reading and 16 to 27 percent in math, over just two years.

Finally, the fundamental rationale for pre-K is to reach children early. But pre-K is not actually early—it's simply a year earlier than kindergarten, just as kindergarten is a year earlier than first grade. Scientific research is overwhelmingly clear, however, that “early” in a child’s development does not mean “a year earlier than kindergarten.” It means the prenatal period and the first year or two after birth.

Indeed, a rapidly growing body of research shows that permanent gaps emerge by the time children turn two. A child’s abilities at 24 months—or even 12 months—of age predict skills at kindergarten entry and, in turn, school performance thereafter. Substantially changing the trajectories of children’s lives requires intervention that occurs “early” as defined by *science*, not by K-12 schools.

The fight for pre-K, however well intended, is the wrong fight for children who need our help the most. If New Mexico’s goal is to expand the school system and provide free pre-school to wealthier parents who otherwise have to pay for it, adding a pre-K grade to the public schools makes perfect sense. If the state’s goal is to improve the life chances of the most disadvantaged children, however, it is a deeply misguided approach.

## Notes

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<sup>1</sup> New Mexico Legislative Finance Committee Program Evaluation Unit, Program Evaluation: Prekindergarten Quality and Educational Outcomes, June 10, 2020, [https://www.nmlegis.gov/Entity/LFC/Documents/Program\\_Evaluation\\_Reports/Prekindergarten%20Quality%20and%20Educational%20Outcomes.pdf](https://www.nmlegis.gov/Entity/LFC/Documents/Program_Evaluation_Reports/Prekindergarten%20Quality%20and%20Educational%20Outcomes.pdf).

<sup>2</sup> Spurious Correlations, <https://www.tylervigen.com/spurious-correlations>.

<sup>3</sup> Mark W Lipsey, Dale C. Farran, and Kelley Durkin, "Effects of the Tennessee Prekindergarten Program on Children’s Achievement and Behavior through Third Grade," *Early Childhood Research Quarterly* 45 (2018): 155-176, <https://www.sciencedirect.com/science/article/pii/S0885200618300279>.

<sup>4</sup> Mike Puma, Stephen Bell, Ronna Cook, Camilla Heid, Pam Broene, Frank Jenkins, Andrew Mashburn, and Jason Downer, *Third Grade Follow-Up to the Head Start Impact Study: Final Report*, October 2012, Administration for Children & Families, <https://files.eric.ed.gov/fulltext/ED539264.pdf>.

<sup>5</sup> Grover J. Whitehurst, "Does State Pre-K Improve Children's Achievement?," Brookings Institution, July 12, 2018, <https://www.brookings.edu/research/does-state-pre-k-improve-childrens-achievement/>.

<sup>6</sup> New Mexico Legislative Finance Committee Program Evaluation Unit, Program Evaluation: Longitudinal Student Performance Analysis-Impact of School, Teacher and Program Interventions, November 17, 2017, [https://www.nmlegis.gov/Entity/LFC/Documents/Program\\_Evaluation\\_Reports/Longitudinal%20Student%20Performance%20Analysis%202017.pdf](https://www.nmlegis.gov/Entity/LFC/Documents/Program_Evaluation_Reports/Longitudinal%20Student%20Performance%20Analysis%202017.pdf).

## About the Author

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