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The Influence of Publicly Funded Preschool Programs in New Jersey Public School Districts on Student Achievement in Fourth Grade

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APPROVAL FOR SUCCESSFUL DEFENSE

Stephanie E. Kuchar has successfully defended and made the required modifications to the text of the doctoral dissertation for the Ed.D. during this **Fall Semester 2019**.

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The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation to be bound as page number two.

Dedication and Acknowledgments

This dissertation is dedicated to my sister, Jacqueline Kuchar. The challenges she has been faced with and continues to battle on a daily basis has inspired me throughout this dissertation process. Her perseverance, determination, and sheer will has challenged me to take on this rigorous academic exercise. Jackie has taught me to always be the best version of myself, and to never let anyone else define who I am. She once said, "Beast, no days off," and that is how she lives each day and approaches every challenge. I am blessed and thankful for all she has taught me. This dissertation is for you—with all my love, admiration, and appreciation.

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Abstract

This correlational, explanatory, cross-sectional study aimed to explain the influence of a school district having a publicly funded preschool program on English language arts and mathematics test results on the New Jersey Partnership for Assessment for Readiness for College and Careers (PARCC) for fourth graders. The study aimed to provide research-based evidence on the influence of publicly funded preschool programs on a district. The study used focused on the thirty-five (35) New Jersey school districts that had public preschool programs in 2012. The study concluded that consistent student attendance was a significant factor in districts with preschool programs when it came to test scores in both mathematics and English language arts.

Keywords: preschool, preschool education, early childhood education, academic achievement

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Chapter 1

Introduction

Background

Historically, the number of years of schooling that a child receives has been increasing. Although public education opportunities were sparse and involved one-room schoolhouses in the early years of this country, as society began to change it was realized that more formal education was needed to keep up with the demands of society. In the post-World War II era, completing high school became more commonplace. As of 2019, the most commonly accepted formal public education begins at age five in kindergarten and continues through the completion of high school. Although post-secondary school and preschool programs have become more widely available and used with each passing year, these mostly remain open only to those with the financial needs to afford them.

According to the National Center for Education Statistics, 54% of three- to five-year-olds with parents who possess postgraduate degrees were enrolled in preschool programs as opposed to merely 30% of those whose parents possess less than a high school diploma (NCES, 2018). Post-secondary education has a system of grants and loans that allows for financing, but the expenses continue to rise. Many argue that the government must pay for these programs to make sure students receive the adequate education needed to function in society.

Many students who live in poverty enter kindergarten or first grade so far behind their peers that it is impossible for them to ever catch up (Barnett, 2010). Students living in some of the country's most depressed areas are reading at less than a third-grade level in high school. The percentage of students who go on to attend college is lower in many districts that serve students of poverty compared to districts that do not. For many, not having any formal education

until age five combined with the negative effects of poverty does not allow them to have any potential chance to succeed.

The proposal of universal public preschool is a relatively new concept, especially in New Jersey. Universal preschool does not currently exist as of 2019 in New Jersey. Preschools were exclusively the purview of parochial schools and other private organizations. Some preschool services existed for students with disabilities prior to kindergarten, but aside from these basic levels of help, there was nothing for the average student to begin studying. Preschool was open exclusively to those who could afford to provide this opportunity to their children. Opportunity is exactly what it was; a program provided young children with a head start over their peers in the formal learning process. Montessori and other similar programs gained heavily in traction and their enrollment numbers increased. Since 1970, the number of students nationwide enrolled in preschool has more than doubled (NCES 2018).

New Jersey instituted a number of publicly funded preschool areas, almost exclusively in those areas in what were formerly known as the Abbott Districts in the 1980s. These districts, named for the landmark Supreme Court case that sought to bring additional funding to impoverished school districts, received state aid to begin providing for these programs. The academic results of the programs were mixed, but there was a general academic consensus that preschool was beginning to provide real opportunity for students to close the achievement gap with their wealthier suburban counterparts.

As this became apparent, the amount of money the state allocated toward publicly funded preschools continued to grow. In the 2016–2017 school year, the state allocated a record amount of funds to a record number of school districts. In Newark alone, nearly 2,000 students were enrolled in full-day preschool programs in the 2016–2017 school year (New Jersey Department

of Education, 2017). Even so, the vast majority of students in the state remain without access to any sort of publicly funded preschool program. Despite the evidence that these programs provide strong benefits, legislators have not been convinced that they are worth the exorbitant price tag to already overburdened taxpayers.

Focus on Public Funding

Almost any municipality offers some sort of private, pay-for preschool program that seeks to address the educational needs of children too young for the traditional K–12 public school system. The problem with the current system is that it only exacerbates the achievement gap and inadequacies of the educational system that exists when only available to the wealthy. This is not to suggest that these programs should cease to function or stop expanding to the detriment of the students whom they service, but there needs to be public financing of preschool to level the playing level. Every child should be given the same opportunities to maximize his or her educational potential and not fall dangerously behind other students of similar situations before even stepping foot in kindergarten.

This is why it is imperative for the focus to be on the impact of publicly funded preschool programs and the effect they have. Private preschools have always existed and always provided some sort of enhanced learning for the students who participated. The major question is whether public programs are having a similar effect and the best way to expand them in a cost-effective manner.

Funding for public preschools in New Jersey has increased in large numbers in the past few years but it goes nowhere near enough to cover the costs of a universal preschool program. Even when funds are provided to districts, there is a significant problem for these districts to provide space. Districts simply cannot accommodate the influx of new students. Some districts

are receiving numbers to provide only a small inadequate program.

Statement of the Problem and Purpose

Results from existing literature suggest that in some cases students from poverty who participated in publicly funded preschool programs perform better on Grade 3 standardized tests as a group than those who did not participate (Barnett, 2010). This suggests that there is a correlation between participating and the programs and future success.

What still needs to be researched is just how strong the association is between preschool education and later success on standardized measures of achievement after Grade 3. Further research may determine that preschool provides only a slight benefit after Grade 3 and is not worth the high cost that instituting these programs creates. The space requirements are also an issue as districts would be required to take in a large influx of students for already terribly overcrowded schools.

This study focused particularly on the academic achievement of students in Grade 4 who attended a district that offered public preschool. It analyzed the association between a district having a public preschool program and success on fourth grade PARCC scores. In 2018, the statewide mean percentage of students scoring proficient or above on the 2018 Grade 4 PARCC Mathematics section was 49% and the statewide mean percentage scoring proficient or above on the 2018 Grade 4 PARCC ELA section was 58%.

The purpose for this correlational, explanatory, cross-sectional study was to explain the association between publicly funded preschool and factors that affect student achievement after Grade 3 as measured by the New Jersey Grade 4 PARCC assessments in English language arts and math.

Research Questions

After compiling data from the Department of Education and other reliable sources, the following studies were conducted in order to better understand the relationship between preschool and later educational success. All the questions were guided by the main question: "What is the effect of publicly funded preschool on overall student achievement?"

Research Question 1: What factors associate with publicly funded preschool education and academic achievement in English language arts of the Grade 4 students as measured by the NJ PARCC?

Research Question 2: What factors associate with publicly funded preschool education on academic achievement in mathematics of Grade 4 students as measured by the NJ PARCC?

Research Question 3: What is the influence of district/school characteristics with a publicly funded preschool program on academic achievement in English language arts of the Grade 4 students as measured by the NJ PARCC?

Research Question 4: What is the influence of district/school characteristics without a publicly funded preschool program on academic achievement in mathematics of Grade 4 students as measured by the NJ PARCC?

Hypotheses

Null Hypothesis 1: No statistically significant relationship exists between publicly funded preschool education and academic achievement in ELA of fourth-grade students as measured by the PARCC.

Null Hypothesis 2: No statistically significant relationship exists between publicly funded preschool education and academic achievement in math of fourth-grade students as measured by PARCC.

Null Hypothesis 3: No statistically significant relationship on academic achievement exists between district/school characteristics and publicly funded preschool programs.

Null Hypothesis 4: No statistically significant relationship on academic achievement exists between district/school characteristics and publicly funded preschool programs.

Variables

The independent variables related to the school district were: (a) enrollment, (b) staff attendance rates, and (c) publicly funded preschool program. The independent variables related to the students within the school district were: (a) percentage of students eligible for free lunch, (b) the percentage of students who receive special education services, (c) the percentage of students who receive English Language Learner services, (d) student attendance rate.

The dependent variables for this study were the 2018 Grade 4 school district percentages of students who achieved a level 4 or above on the English Language Arts and Math Partnership for Assessment of Readiness for College and Careers (PARCC) test scores.

Significance of the Study

Expansion of preschool programs is happening all over the state at a staggering pace. Funding from the state and local levels has increased and allowed for the continuing expansion of these programs. There exists research that suggests children who attend preschool score higher on Grade 3 standardized tests than children who do not. However, less quantitative research exists on the relationship between preschool attendance and achievement after Grade 3. This study used a correlational design and controlled for school and student variables that have been demonstrated to influence achievement on standardized tests in fourth grade.

Limitations

The most important limitation of the study was the number of districts that offered a standardized public preschool program. This number was far outweighed by those that did not, and the existing literature on these programs was lacking. Since this was a correlation study, it is not possible to ascertain cause and effect of the programs. Limiting the data collected to analyze only one grade level over a short period of time also limits its usefulness despite the fact that this was the only possible way to conduct this study.

Delimitations

The delimitation of the study is using only publicly funded preschool programs. The study does not take into account private preschool programs because they are selective in which students they take and are only open to those with the means to pay for them. Any publicly funded program open to all students, even if not directly affiliated with school districts, was considered in the study. The study also did not look at students older than the boundaries set.

Definition of Terms

Achievement Gap: The variance of student achievement between groups.

Limited English Proficient (LEP) Students: The percentage of LEP students in the school. It is calculated by dividing the total number of students who are in Limited English Proficient programs by the total enrollment.

PARCC: Partnership for Assessment of Readiness for College and Careers in Mathematics and English Language Arts. The PARCC assessments more accurately measure the higher-level skills developed under the New Jersey Student Learning Standard and provide parents and educators with meaningful information to improve teaching and learning.

Student Achievement: This was measured using certain statistical achievement markers students registered on standardized testing.

Student Attendance Rate: The average rate at which students in a particular grade level attended school in a particular school year.

Students With Disabilities: The percentage of students labeled "special needs" by the district report cards put out by the Department of Education (NJDOE).

Free and Reduced Lunch Status: The number and percentage of students eligible for free or reduced priced lunch as monitored by the Department of Education (NJDOE).

Organization of the Study

Chapter I outlines the status of public preschool programs and provides the background for the issue to be studied regarding the effect of the programs. It sets forth the barometer by which the success or the failure of the programs would be measured as well as sets forth research questions and variables. The researcher sought to determine the impact on fourth-grade students in a district that had a public preschool program regardless of the participation of any individual student in such program.

Chapter II focuses on the existing literature for the topic and provides an in-depth theoretical framework which defined the focus of the study.

Chapter III is concerned mainly with the research methods of the study. It focuses on the statistical analysis that would be used and the procedure for how it would be conducted.

Chapter IV provides the results from the data analysis.

Chapter V puts the data analysis in context for its significance and outlines the conclusions of the study and its applicability to the educational world.

Chapter II

Review of the Literature

Until the turn of the 21st century, the idea of universal, publicly funding preschool was not a widely supported concept in the United States, due in part to its cost and what was seen at the time minimal academic benefit to the students who would benefit from its existence. Over time, some research began to suggest that students who participated in some sort of formalized learning before entering kindergarten exhibited both short-term and long-term benefits over those who did not participate in such programs. Results from some research suggested that private and public options could benefit the educational process and provide valuable learning skills that would allow children to enter the normal education process at a higher level than they would without any formalized training.

Not only did the students who participated in preschool do better in early education, including higher kindergarten readiness, they were more likely to score higher on standardized tests up until Grade 3, and in some cases in late elementary or middle school (Ackerman, 2005). Some results also suggest that students who attended preschool were more likely to graduate from high school and even in some cases more likely to attend and eventually graduate from college (White 2015).

However, some of the studies of the influence of preschool on early elementary school achievement did not control for socio-demographic factors. The fact that many of the preschool programs were situated in private settings and attended by students who would also otherwise demonstrate high achievement on standardize tests calls into question some of the positive findings. It is harder to judge the effects that private preschools have on academic achievement of the local school district. Most public programs required students to live in the district where

the students lived. Private programs take students from numerous towns. Factoring in the nature of most private programs, it is likely that students who attended private preschool were attending them because they were the ones available or the best, not because they lived in the district itself. Students then disperse to various public and private schools after preschool, making it difficult to determine the influence on later schooling.

New Jersey and New York Preschool Opportunities

Private preschool is a luxury and only those with financial means can afford to send their children if their local public school does not offer preschool. For this reason, lower income students who live in districts that do not offer public preschool can sometimes be at a disadvantage if they cannot afford tuition. In 2005, Jon Corzine was the first gubernatorial candidate since the late 1980s to revive the idea of universal preschool.

Then public opinion began to move on the subject and many began to advocate for universal publicly funded preschool education programs as the great educational equalizer. It became a fight not only for expanded programs, but a fight to make urban education work when it has been broken for so long. The common logic by some policymakers was that if students from low-income and at-risk communities could be given this additional program, the gaps would begin to shrink between them and the students of more wealthy backgrounds.

Following the election of Jon Corzine as governor New Jersey increased the amount of financial aid provided to public preschool, which increased the number of preschool seats available in public schools. The state's effort to expand public preschool began in earnest with the Early Launch to Learning Initiative (ELLI) and Early Childhood Program Aid (ECPA) programs that were among the first in the state to begin providing funding to districts for public preschool in the early 2000s. For the most part, this funding only went to support preschool in

the approximately 30 poorest of districts in New Jersey, known then as "Abbott Districts." Those districts that have traditionally been labeled "Abbott Districts" are the famous court case of the same name who were the major beneficiaries of the legislation. Funding increased again since 2016 (Abbott v. Burke 100, N.J., 269, 1985).

In 2013, while running for mayor of New York, Bill DeBlasio won the election while campaigning on universal preschool as a major plank of his campaign (NYC, 2017). During his term, DeBlasio expanded his platform to include preschool for all three-year-olds as well as the four-year-olds he originally intended to cover. This marked a seismic shift in the preschool debate; it was now a winning strategy for politicians to campaign on expanding preschool. The national tenor began to change and preschool began to be at the forefront of the educational movement.

Big city mayors across the country have continued to push and expanded the dialogue on incorporating public preschool into their agendas. New Jersey is no exception to this rule and the trend is continuing. Jersey City Mayor Steven Fulop has made expanding preschool access so vital to his plans to improve the city; he has made purchasing new facilities to house the programs one of the core goals of his administration. In 2017, Phil Murphy made preschool education for every student one of the core tenets, which he seeks to implement if elected governor of New Jersey.

Today, these districts are referred to differently, shying away from the Abbott title, which tends to carry a more negative connotation but still exists. These thirty-five districts account for well over half of the school funding money allocated by the state of New Jersey. Even as attempts to change the formula are exchanged, the most recent budget only slightly altered the formula and still kept monies to fund the preschool programs that were currently in place.

The original Abbott decision stemmed from the major discrepancies between funding for school districts. Under the previous formulas, those cities with low tax bases received substandard funding because the state did not allocate extra money to these districts to make up the difference. Abbott stood for the principle that the "thorough and efficient education" clause of the Constitution meant that the state must be responsible for equalizing the playing field for these poorer districts.

Since the original decision, a number of subsequent rulings have expanded or constricted different portions of Abbott, but to this day, despite major pushback to change, the formula that gives disproportionate funding to poorly funded districts remains in place. In the last fiscal year, the highest per pupil spending in the state was in Asbury Park, one of the poorest districts, which could not afford adequate education under previous formulas that do not take the funding of the municipality into account. Although there is certainly a strong argument to be made that there is a poor spending of resources rather than a revenue problem, it is obvious that the revenues being expended are higher in these areas.

It was rare if funding for public preschool went to any district other than those labeled as "Abbott," and if it did it was not adequate to compensate for the cost of creating a program. Some districts did exactly that with local spending, but these were rare and in districts with high achievement. Most districts relied on private preschools if a parent thought it was appropriate for their children, or sometimes in a compromise offered preschool services that were paid for by parents entirely and just held in public schools under public guidance. These quasi-public programs used public facilities, but were still not open to just any student. However, it did seem to suggest a changing of the guard and a watershed moment that spurred further advancement in the idea of a universal public preschool program.

The cost-benefit analysis to these programs must always be considered in the construction of any good public policy. Costs of creating these programs are excessive (Novoa, 2017); they must draw up a curriculum, hire staff, find space for the programs to be housed, and then once up and running, pay to maintain them. For some districts, it may even be a question of whether they have anywhere near the potential amount of space that would be needed to fit these programs. Space is already at a premium so if new construction would be required, it would be a cost that might be too difficult for all but the richest of districts to bear, even if the state were to contribute significant amounts of money to funding them.

Preschool may not be the only method to improve student achievement; there may be a cheaper and possibly more feasible alternative that would provide equal or better results. However, the money spent on preschool education can reduce other costs, such as remedial classes to properly adjust students later on as well social programs needed to support people without adequate employment to meet expenses. If that winds up being the case, the program may ultimately be cost neutral in the long run despite any initial costs associated with getting the programs up and running to a functional point.

Focus of the Review

This review focused on topics associated with the influence of public preschool on overall performance of students in a district with publicly funded preschool programs available. The focus was not on the individual students, but rather the aggregate academic performance of the district after implementing such programs. It took into account the length of time the district has had such a program, the type of program it offered, the number of students it accommodated, and the overall impact the program had on the district.

The purpose was to evaluate the existing literature and theories about the influence of

publicly funded preschool on student achievement in districts that offered programs for preschool-aged children when controlling for other variables that influence achievement. These variables can include things such as income levels in the district and past history of other attempts to improve the district. There can also be information in the literature about the cost of such programs and the cost-effectiveness.

Analyzing the literature to determine whether the programs are designed correctly and cost-effective was important. The literature provided insight into how certain programs are designed to determine which may be more effective than the others. Just because a program exists is no guarantee of success; it is equally important to determine which programs work. Knowing the model has produced success will allow it to be replicated.

The analysis focused on why the programs were scaled back and what the effect has been on the district. Reasons for scaling back might be strictly financial or an infrastructure issue, but it might also be the ineffectiveness of a program; a program so ineffective that the district decided it was better to shut it down than keep funding it might have been a determining factor in whether to continue the expanse of programs. The short- and long-terms effects of the end of these programs will prove valuable in determining additional worth.

Criteria for Inclusion

Research used in this review had to contain the following criteria to be included:

- Correlational, quasi-experimental, and experimental studies with quantitative methods
- Peer-reviewed documents
- Government documents and records
- Information published in the last 20 years (except when making historical notes)
- Studies that included the relevant grade levels and student groups

- Seminal works
- Federal and state legislation and reports
- Think-tank reports

Existing Reviews

Existing literature on the topic varies on the influence that preschool has on academic readiness for students in a district that offers a preschool program. There are two distinct foci of the research on preschool education: (a) how it affects students to be prepared to enter traditional schooling in kindergarten, and (b) the overall affect it has on students throughout their education career. Readiness can be determined by how students in a district are prepared for standardized testing in elementary school when they are in a district that offers these programs. This can be judged by their ability to possess basic educational skills that they may otherwise not have. Some students simply obtain these skills through learning at home, but whether a student is ready for kindergarten is often an indicator of future success.

Failure in kindergarten can quickly turn into failure in succeeding grades and eventually perhaps dropping out or at least not being prepared for postsecondary education. As noted before, whether this is a four-year institution or another type of program the child must at least have some basic level of preparedness in order to succeed. However, if not even basic preparation is done at an early age, it is possible the student may not have hope at going to a four-year university.

Kindergarten readiness itself can also affect the overall academic body of work of a student (Goldstein, 2013). How ready are the students when they enter third grade, fourth grade? Are they any more "ready" for these grades because of the prerequisite skills and learning attributes that they acquired as a result of attending publicly or privately funded preschools? The

research varies on these topics but it is certainly something that has been measured extensively especially in the last few decades and more so in the very recent past. The districts themselves should show an improvement from having these programs, even if it is gradual. According to the research, it can take a few years from the implementation of a program for a district to begin to see its positive effects take hold.

A district must implement the program to see if there are any potential results; however, this is not to say that the results will necessarily follow immediately. Many districts may wait to see the effect the programs have on other districts to see if the investment is worth it for them as well. It is hard for a school to implement a public preschool program in New Jersey only to rescind it a few years later. This is why it must be a well-thought, well-orchestrated process rather than a knee-jerk reaction aimed at satisfying critics of the current educational scheme. There is certainly a more tangible benefit for some districts over others, which see preschool as the last hope of a failing school system.

Writing in the *American Prospect*, Macinnes (2010) argued that public preschool is among the only things that have allowed urban districts to keep from completely going under. He concluded that public preschool not only gave students a distinct advantage, but that it continues to grow throughout their academic career. The progress achieved by these students is not something that can simply be made up with additional programs later on and must be provided when they are young and still able to absorb the information.

It is argued that if not for early intervention programs like publicly funded preschool Union City, New Jersey public schools in urbanized Hudson County would have gone under and been taken over by the state like some other urban districts in Newark and Camden. Schools have become particularly resistant to state takeover, which comes with strong restrictions and

goes against the home rule that so many New Jersey districts desire (Yi, 2017). For Newark, return of the local schools to local control remains a hot bed issue that the citizens demand almost every year from their elected officials.

Publicly funded preschool programs may be the key to improving districts and preventing state takeover and an end to the autonomy of the district. These programs, the author argues, are vital to maintaining the quality of education that allows students to succeed. Rather than data, which strictly looks at students in a vacuum, this provides concrete numbers but applies to a very real-life situation.

The school districts readily improve after having these programs, and even if not necessarily on paper, the attitude changed (Cascio, 2013). This can be just as important to turning around a district and can eventually lead to improved student achievement as the students themselves begin to adjust to the newfound success of the district. Mental aspects of success can never be overlooked in determining if a program is effective. Perception, in this case, can become reality if not necessarily directly tied. These students were not numbers as part of a test study, but rather their stories are explored and the shaping of communities is looked into (Brown, 2006).

The National Institute for Early Education 2016 conducted research that is more closely linked with readiness for kindergarten. They argue that the "most promising strategy" for combating failure in education is providing universal preschool. It provides an education boost to students that simply cannot be matched by other programs. Public preschool, they believe, can be the great equalizer to bring normalization to public education and help close the achievement gap that has plagued public education for decades. Numerous studies are cited noting that students in preschool, especially those already at risk because of poverty or poor

home environments, score significantly higher on tests measured to gauge readiness for kindergarten than those with no formal education. However, the study does not necessarily conclude that publicly funded preschool is the best-case scenario and seems to have a sort of bias toward instituting programs.

In 2013, the Child Care Youth Forum conducted a study of over 100 children that revealed that those who had participated in a public preschool program showed significant development from having been in the program. The district itself benefitted from having students who were exposed to the program. The presence of such a program allowed for new education opportunities, which were otherwise not provided for under other forms of education. The results of the study concluded a strong academic growth, which provided them for future success, but it also showed other results. It showed that students who participated in these programs demonstrated statistically significant emotional and social growth from even just limited exposure.

This meant that students gained skills they could not possibly gain outside of a group setting, such as the ability to better interact with their peers and adults. These social improvements were linked by the authors to later education improvements because of an overall improvement in attitude by the students in the program. It suggests yet another angle to explore, whether students who participate in these programs succeed later because they are socially ready to do so (Goldstein, et al., 2013). Emotional growth can be just as important to the success of a student as academic growth. Students who think they can succeed are more likely to succeed than those who come to the educational realm lacking a sense of self-worth and feeling of achievement.

This particular study lends great credence to the notion that districts that offer these

programs will see increases in productivity even from students who do not participate in the programs. The participating students will interact socially with the non-participating students and create a greater overall educational environment that will boost the success of the district. Succeed often breeds success and even a few children being successful as a result of having a publicly funded preschool program can lead to improvements for the entire district over the course of years.

Too often students enter kindergarten academically ready to handle the challenges that it brings, but from limited exposure to collateral life learning experiences they lack the social skills and underlying skills needed to succeed (Novoa, 2017). This challenge is not necessarily unique to low-income and at-risk students. This could happen to any child who is not properly exposed to the outside world and other children before entering schooling. Articles like these add to the overall cacophony of facts that go into this research.

This study will focus heavily on whether there is a significant improvement in students' academic success in school districts that receive publicly funded preschool over those that do not. Individual students will not be evaluated, but rather the district on a whole will be taken into account. The review will focus on the short-term and long-term improvements or lack thereof of these districts and the amount of money that is spent. It will concentrate heavily on those districts that have had programs for longer periods of time as they will have more empirical data to study. However, districts that have only recently implemented programs will also serve as an important focal point for the emerging nature of the programs that are being instituted currently. Student achievement will be the most important factor analyzed, and will be done on the macro level of the district rather than the individual students. Over time, these results will be more accurate, encompassing the total impact. This empirical data will be the most accurate indicator

of how the program itself is progressing.

The nature of the programs will also be considered, though to a lesser extent, such as whether it is a program for three-year-olds, four-year-olds, or three- and four-year-olds, and how long the program has been in existence.

Significance of Existing Literature

Current literature available does not paint the entire picture of the effects that preschool education can have on a district. The overall impact is sometimes misstated or requires a deeper understanding of all the factors at play. Many studies available are selected and chosen to promote a specific viewpoint either for or against expanding preschool. A report on the "Economic Returns of Early Childhood Education" concludes that while many experts suggest a $17 return on $1 investment in preschool, the actual number might be closer to $3. The author works for the RAND Institute, a small government think tank that promotes less state intervention in education. The studies conducted are skewed to promote a certain agenda. They will argue that public preschool is a waste of taxpayer money, which serves no legitimate purpose other than to line the pockets of those promoting it, and those employed by the program (Karoly, 2016).

The purpose of their think-tank, then, is to promote policies that save the most money, not necessarily the educational aspect or who it helps. Their policy positions actually have very little to do with whether there is an educational benefit, though this is not to entirely dismiss the study. It serves an important purpose because the cost as opposed to benefit of the program will be an important factor in determining its necessity. If programs that promote public funding of preschool are extremely expensive, yet there is little education growth, then continuing them does not make sense. It only makes sense if the educational benefit is somewhat in line with the

cost that is associated with creating and maintaining these particular programs.

On the opposite side, the National Institute for Early Education Research has a policy agenda in favor of expanding preschool. For instance, it suggests that a need for preschool is nearly a necessity (NIEER, 2016). The tools they need to succeed can only be learned at a young age and failing to do so they are destined for failure going forward. They will go on to be unsuccessful in school and eventually unsuccessful in life. It is a vicious cycle of failure without preschool if the National Institute for Early Education Research is to be believed in its entirety.

Numerous researchers have analyzed the effect of the Head Start program in comparison to other forms of public preschool programs. Head Start is a comprehensive child development program that provides at-risk students with not only education, but healthy meals and social training prior to formal education (Jenkins, 2016). In the 2016 study in *Educational Evaluation and Policy Analysis*, researchers concluded that while the effects of Head Start for one year can oftentimes have the same result as attending preschool, attending a high-quality preschool for a second year rather than a second year of Head Start is more effective (Jenkins, 2016). This difference represented a closing of the achievement gap by up to one-third over participating in a second year of Head Start.

Determining the difference, the programs have become especially important as more options become available and more children are placed into these programs. Amy Lowenstein of New York University said that as of 2018, 63% of children below kindergarten age were placed in some sort of nonparental early care and education (Lowenstein, 2011). Results of numerous studies, according to Lowenstein, show that while cognitive and social development is helped by Head Start, the overall impact is relatively low in the long-term. Her research also showed that the greatest impact was from public preschool programs that were located in public schools. The

most important takeaways from the research was that low-income students benefited most from any of these programs, and that student gains were only sustained if the programs after preschool age were also high level (Lowenstein, 2011).

In *The Federal Role in Early Childhood Education: Evolution in the Goals, Governance and Policy Instrument of Project Head Start,* researchers analyzed the evolution of the project from its beginning decades ago (Kalifeh, 2011). The research points to the start of the project as a way to help impoverished children get health screenings, nutrition training, and minimal educational goals. Over time, the project began to take on more of an education aspect. The most important takeaway from this research is that early childhood education, like most policies, is heavily affected by political winds (Kalifeh, 2011). Understanding the politics behind Head Start is important to understanding its changes and effect.

Along this same idea, the implementation of preschools and Head Start is important to its ability to achieve results (Zigler, 2000). Writing about his experiences as a young academic when Head Start came to be, Edward Zigler notes its shortcomings in implementation and how to learn from mistakes of the past. He calls Head Start a program that was too hastily implemented despite its noble goals. The main goal of Head Start, he believes, has always been social readiness over academic success (Zigler, 2000).

This research shows that while Head Start can provide valuable experiences for some children, its lasting educational value might fade as students continue through school. Children need proper education-based public preschool programs to pick up any meaningful long-lasting skills.

Review Methods

The type of literature that was analyzed was done mostly through use of scholarly databases such as those available through the Seton Hall University library. Data from the New Jersey Department of Education was used to determine both which districts have preschool programs and the funding they receive as well as the test scores in the district before and after implementing such programs. The development of the programs will also be available on this site with historical data and tracking of the funding. Without this raw empirical data there is no way to search and determine what the effectiveness (or lack thereof) has been.

The search terms "preschool," "early education," and "readiness" were the most used terms, though others were incorporated to expand the study. Studies that did not focus on overall student progress and only evaluated the time spent in preschool were not included as the focus was on the impact of preschool on individual children. This study sought to determine the impact preschool has on a district. This means that studies that became personal about individual students had no value, other than perhaps if they contained a greater overall message about how the district was impacted by the addition of such programs.

"Preschool" was the most obvious search term because the study attempted to gather as much data as possible on the topic. It was limited by the fact that some programs referred to themselves under a different name, which is why "early education" was also used, eliminating the chance that some material was missed. Any program a district offerred that may give students access to education before entering kindergarten was covered by the topic of the paper. By encompassing both search terms, the broadest possible base of search terms was arrived at and allowed for the most broad and biggest deviation in results. Narrowing the search results was important, but for a topic such as this beginning with the broadest base was necessary to

maximize the information collected.

"Readiness" was another important portion of the survey; whether the child has obtained the skills to be ready is how the program may be deemed successful. If students do not meet certain "readiness" markers they should not be deemed having benefitted from preschool. Readiness is the easiest way to determine whether there has been a sufficient amount of success. Readiness was measured in relation to its effect on an entire group or district rather than individual students. What percentage of students in a district have met the readiness guidelines at certain junctures was the guiding focus of research done on this particular topic.

Collecting and analyzing New Jersey public school budgets with publicly funded preschool programs was the most prevalent means of collecting data. This included both current budgets and funding levels for the programs as well historical data. Having both pieces of information allowed a comparison of how the funding has grown over time. The reason for including this is two-fold, 1) it shows the growth of the programs and how many students were affected and 2) it gives a more accurate historical picture of the progression of the programs relative to today. It was important to note how much of the funding came from the state and how much from the local districts to see where the impetus for change was coming. If local districts are willing to put more money into the programs, it shows a belief that the programs are working and will be vital to analyze whether the study bears out that these programs are having the same levels of success and are being used to justify their expansion by the district.

There was also be a need to collect data regarding test scores. This was vital in putting together the most complete picture for the entire study. These test scores are the most unbiased empirical way to measure the success of the school.

Limitations of Review

The major limitation was finding studies that reported outcomes on students from districts that have public preschools and progressed through the school system. Public preschool is still an emerging concept so the number of students who have gone through the program and are older is even smaller. Since the overall impact on the district was being looked at and not individual students, it means that the sample size needed to be larger. Given the small sample size, even when these districts and students are found, they may constitute a sample size that is not large enough to gain any significant statistical correlation. This would make the results not as strong as they would be if the implementation of preschool programs was more widespread or had been around for a longer period of time.

If changes are being implemented in preschool now or the past year to improve on previous failures, which may now be corrected, those results will not show up in any students who went through the program previously. Judging a district on its overall preschool program when the program may have been changed drastically to adjust for successes or failures proved challenging. These changes to programs must be incorporated into the research in order to get an accurate picture. Determining where a program has been more or less effective can determine whether it is worth continuing.

It is hard to analyze students who are just beginning public preschool programs to determine if they are going to be ready. It must be students who have completed the program and in order to test the readiness currently, it must be fourth-grade students who are enrolled in a district with a public preschool program. This greatly narrowed down the subject pool and made gathering results even harder than it would have originally been even under the already tight and constricting parameters.

It was also difficult to determine how much outside factors played on the students. Especially in districts with only a limited public preschool plan, parents who take the initiative to sign up their children for these publicly funded preschool programs are more likely to be the parents who take an interest in their child's learning and foster the growth needed for further education success. Determining how much of the readiness and achievement is due to parental instruction and how much is due to the preschool program itself was a strong limitation of this study.

Literature was included or excluded based upon a fairly rigid standard of criteria. First and foremost, all sources would be academic and scholarly or come from reputable sources. Sources with a stated bias were considered, but that bias was accounted for and contributed to the weight and usefulness each piece of literature was given. The following types of sources were considered with the following criteria:

- Peer reviewed studies were included if they were scholarly nature. They represented the highest form of academic research and were given extraordinary weight. If they discussed the effect of preschool on a district they were used but excluded if they were only seeking to determine the effect on individual students rather than the district-wide standard set forth in this paper. Peer reviewed studies that dealt with the effect of *private preschool* were not considered since that was not the topic of the research. If a district has private offerings available for students who wish to pay, this is not relevant to determining the hypothesis posed to this research. The study sought to avoid any mention of private programs aside from their previous relevance if a public program adopted the programs because the public program felt it was giving them the best results.

- Government reports play a vital role and they were included where they showed educational statistics or spending habits related to the study. Reports included were district-wide test scores and readiness scores as well as other educational markers. Reports that detailed spending for preschool programs were needed to determine where the funding was going, and at its basest level, which districts were funding public preschool programs at all. Government reports that detailed individual students or districts without public preschool, or those where the programs were too new to glean any useable results were excluded. Since these reports were merely empirical data that stated results, there was no need to adjust for inclusion or exclusion based upon any bias.
- Think tank reports were considered, but their bias played an important factor in how they were included. Think tank reports that were created for the sole purpose of promoting or opposing preschool programs were taken into account only for the raw data which they offered. Their conclusions were not given weight unless they were backed up by the results that the study concludes. Independently, conclusions drawn from think tank reports were not considered.

  Often times, these reports are paid for by a company in order to curry favor for a particular position. A think tank does not exist for the sole purpose of conducting independent research; it is pushing a viewpoint. It is likely to bury any research that does not subscribe to this viewpoint and instead, replaces it with research that conforms to its viewpoint. If possible, it may be pertinent to determine whether any research was done by the think tank that did not conform to the desired results that the study which was published portends.
- Legislation was included in the study, as well as pending legislation that affects preschool

education. Funding bills were the most included legislation to show just exactly how these programs were being funded and at what rate. Legislation that showed how these programs were created and administrated was also included. There was not a limit to legislation, either state or federal in nature, and both were included as a means of comparison.

- When analyzing studies, only those that pertained to public preschools were included. The entire purpose of the study was to gather the effect of a public preschool on a district. While private preschools could be helpful to determine what programs can work for public preschools, the studies of these schools do nothing to aid in determining the effect of public preschools on a district. Including private preschool studies would only serve as a detriment and not provide any particular useful information. These private preschools may have an impact on the student population as a whole, but it is irrelevant for purposes of this study. Almost all districts already these programs available, but to discern if the students who attend these programs even wind up living in the district during this time, it is impossible to determine whether they continue to progress through the district school system afterwards.

Research that used qualitative observations was not considered for purposes of this study. The study only sought to make quantitative conclusions that can be easily interpreted. Qualitative information on this topic is simply too subjective and not useful for determining the overall effectiveness of the programs. Hard empirical data is much more effective, though it is necessary to be careful, as numbers can be easily manipulated to say whatever you want in analyzing particular benchmarks. Preliminary research has already shown that there was

sufficient information available so that bringing in difficult and confusing qualitative research was not necessary.

Methodological Issues With Existing Literature

One issue with the existing literature that has already been reviewed was that it did not provide clear determinations about whether the same children would have succeeded without preschool. Since the comparison is only with districts in this study, it does not appear to be as much of an issue but it would still be helpful to know if the students being compared were a majority of students who went to preschool, or simply just students benefitting tangentially from those who did.

Often times in the existing literature there was not enough of a control group to compare against, or the control group made up a slightly different subset of the population. Comparing students who are in public preschool with those who are not is harder to do if the program is universal. This is why it became necessary to draw the focus of the study to the district rather than the individual students. There was simply not enough raw data to determine and correlate students in particular who went to those programs. It was also difficult to find programs where the length of time the program had been implemented was long enough to draw any meaningful conclusions.

Comparisons can be drawn across district lines but these are not always accurate. It was possible to draw comparisons to students who previously went through the same schooling but did not have preschool; however, any changes were also subject to being from some other factor. The best comparison is students in the same classroom, some with preschool and some without, and finding this data was not impossible but proved to be a challenge. Studies often do much cross-comparison or lump students in as a whole.

Another methodological issue with the existing literature was controlling for student and school variables that can influence student achievement other than preschool. Often times if the district adopted public preschool, all the students who were in the district (or at least a great majority–obviously there are transfers) participated in the same program. This forced the results to be compared to either students in other districts or students from past years. Problematic in this was that no two districts were exactly alike in their student demographics, teacher demographics, programs, and thus it was very difficult to provide for exact controls; it was more about drawing similar enough comparisons to allow for a meaningful study. Comparing students to past years is often what is done with test scores, but there has to be a sufficient number of years. If you are only comparing the first two classes to get through a relatively new program, then you run into the issue of whether the particular group of children was just better or more suited to learn from what was currently being offered by that upstart program.

Examination of Current Literature: The Body of the Review

Test scores alone can be an effective way of measuring success, but Education Testing Services argues that the only way to truly understand them is to combine them with observations (Ackerman, 2014). Ackerman argued that while policymakers increasingly rely on test scores to evaluate the success of early childhood education, observations can play an important role. This study supports the notion that test scores are the most effective way of evaluating performance because of the subjective and sometimes nature of observations. If an observation is to be done, the author argued that it must incorporate a best practices method that attempts to remove subjective criteria as much as possible.

When a district has a public preschool program, an added benefit is the ability to align the curriculum from preschool to the next stage of learning (Jacobsen, 2016). In his study *Building*

State P-3 System Jacobsen analyzed different states that have implemented public preschool programs. One of the states discussed was Oregon, which has created preschool hubs that feed directly into the public districts. He analyzed the effect this had on learning and noted that the ability of the preschool to feed into the district made educational transitions easier. The conclusion was that aligning preschools with traditional public schooling allowed for improvement to students by having curriculums that built strongly upon the foundation from preschool rather than students having been exposed to a different type of learning.

Preschool programs located in district oftentimes are more successful at providing advantages to students than ones located in the community according to the Child Youth Care Forum (Goldstein, 2013). This study also broke down the differences in programs like Head Start, which provide needs beyond educational programs, and those which provide a more basic educational plan. The overall conclusion of the study was that students attending "garden variety" public preschool programs showed substantial education and social progress over students who did not. This study, however, did not address the overall impact on the school from these students.

Andrew Karch studied the reasons for an increase in preschool funding in certain areas and noted that it is often difficult to break the status quo (Karch, 2010). His study concluded that areas that traditionally had a large number of Head Start enrollments were less likely to fund preschool because the momentum was already toward Head Start. Coordination between programs also can lead to improved results, which argues the point that districts will be better off if they have coordinated preschool programs. Karch believed that collaboration between programs was the key to the ultimate success of early childhood education.

It is clear from anecdotal results that students who participate in public preschool have a

clear advantage over students who are not (Dessoff, 2010). Dessoff argued further that districts need to adopt a "culture change" to ensure the public preschool programs are successful. This can include, in his estimation, things such as adjusting preschool to provide for a more holistic approach to learning rather than strictly academic instruction. Successful programs according to this study are those that teach young students concepts and how to think rather than attempt to instill hard knowledge and facts.

Approaching the global macro effect of universal preschool, F. Chris Curran studied the effect of these programs (Curran, 2015). Curran concluded that states that adopted preschool programs eventually tended to move toward increasing them, almost never decreasing. This would lend credence, in his mind, to at least the anecdotal belief that public preschool is a worthwhile endeavor. The study advocated for the use of mixed-method approaches to allow for all students to participate in some form of early childhood education. He believed that all students will eventually benefit from the students who participate.

A study commissioned by the *Journal of Educational Psychology* analyzed whether preschool had a larger effect on students based on economic status (Miller, 2017). In effect, whether public preschool or simple economics played a larger role in determining the success of district results. This study sought to prove that the economic status of students in a classroom would play a larger role than whether students had been exposed to public preschool. The study concluded that test scores were in fact higher for students with higher-level incomes as opposed to lower-level incomes who had attended preschool.

Practical and Research Significance

The practical significance of results is the most important part of any study. Applying what is learned to real world applications is vital to improving the educational field through the

research and information that is acquired. Without a real-world application, the data simply becomes another academic exercise that does not help to improve the lives of students. The goal of all educational research must be to determine the practical implications and also how to best implement these practical implications. The research conducted by this study will aid in the production of both.

The practical implication that the data sought to obtain was whether publicly funded preschool programs in New Jersey have an overall impact on closing the achievement gap in the districts which they exist. For the program to be practical, it must be determined that there is a positive overall impact on the district, which can be easily measured and borne out by the statistical analysis. This requires substantiating data that students perform better after the implication of the programs and that they will continue to improve as the programs continue to exist and to expand. A program is also considered practical in the sense that it can accommodate as many students as possible and lead the district to improve without sacrificing other students. This means not only must it be economically feasible, it must not dilute other resources such as space and staff away from other programs. If the preschool programs are effective, but also take away from other important barometers then they will not be deemed practical. In this instance, the research would most likely show that the achievement gap does not close because any improvement that preschool brings to the district is negated by the negative impact it has on the reduction of other programs.

There is also a practical implication for programs where the data does not suggest any improvement in closing the achievement gap. Either it shows that the programs are ineffective or they provide ways to improve the programs to make them practical. Many programs fail not because the idea of public preschool was not appropriate, but because they are executed in a

manner that sets them up for abject failure. This can be due to overcrowding issues or a lack of spending. Half-hearted commitment to public preschool programs does not help in fostering the goal of making sure that all students can achieve success.

Theoretical Framework

Understanding the effect of preschool on students, especially those who are merely exposed to others who went, requires an understanding of educational theory. Two educational theories provide a strong foundation for understanding this particular topic: constructivism and the production function theory. These two theories provide a strong basis for the belief that students are shaped by both their environment and what tools they are given. This is at the heart of the effect of public preschool on a district, the idea that students exposed to other students who have an educational background and more skills will eventually find their way into the other students.

Constructivism is based upon the idea that learning is a never-ending interaction between a person and his or her environment (Harkonen, 2003). Under this theory, every individual constructs his own meaning of what he is learning based on experience. The most radical idea that this viewpoint perpetrates is therefore the idea that nothing has meaning except for how the individual comprehends it to mean (Hein, 1991). This also means that learning is a social experience as what a child absorbs from other children goes to the whole foundation of what they are understanding. This is why public preschool having a positive effect on students who did not attend is possible. Those students who did attend and reap its direct positive benefits will become incorporated into the learning of the students who did not.

A basic tenet of this idea is that learning cannot simply be a product of rote memorization and presentation of facts. Even students who learn this method are in a way also learning a

constructivist way; they are just applying what is in front of them to what they already know and synthesize the information (Garner, 2007). Garner argued that even information that is gleaned from reading and other writing is merely taking what is already known by the individuals and applying it to the new information presented in front of them. Students will only learn when they are able to make sense of what is put in front of them.

Jean Piaget is one of the preeminent scholars related to constructivism and his work is of particular use in understanding preschool education. Piaget was a strong proponent of "operative knowledge" or the idea that people learn from the changes and things around them (Blake, 2008). Through this lens, Piaget believed that learning is a combination of assimilation and adaptation. That students become what they are exposed to. This differs from other theories of education that believe teaching is mostly the effect of the person teaching and how well he or she conveys the material. This theory, in contrast, is much more complete and focuses on all the potential ways in which learning can occur.

For purposes of analyzing the effect on students, it is important to further delve into Piaget's stages of development. Preschool-age students to second grade are part of what he described as the "pre-operational stage" (Ojose, 2008). In this stage there is a lack of logic and rational thought. The stage is mostly defined by children absorbing the world around them and beginning to apply meaning to it. Children tend to learn and absorb more from their peers and do not have the respect for "moral authority" of adults that older children begin to develop (Kaylan-Masih, 1973).

In this sense, those children who do not attend preschool but are exposed to those who do will begin to learn from those children. This may not necessarily mean that they absorb the same knowledge as it relates to facts and figures, but they develop a manner of thinking and way about

them, which is constructive. This promotes the idea that all children can benefit from a district having a public preschool program even if they themselves do not attend.

The production function model is another theoretical approach under which to analyze this effect. A production function model analyzes whether the effort placed into an activity yields the desired result (Hanushek, 2008). Applying this to the issue at hand, is the amount of money paid to preschool education worth the output that is received from the student? Conducting the study with this framework in mind helped to determine the ultimate effectiveness of preschool for a district.

It is possible that the correlation may not be strong enough to logically argue that the programs should continue and be fully funded. The research bore out that the success rate of students participating in preschool programs was higher than other programs. This suggested that even with alternative programs the funding should continue to go to preschool, such as extended school day, longer hours, or more faculty support staff for traditional classrooms.

Key variables are the programs that they are placed into and the demographic from which they come. The program is important to determine whether full day makes a difference compared to half-day, whether a program that promotes social experiences over academic progress tends to show different results. The variation in programs may suggest that one potential avenue of looking at the situation is superior to another avenue rendering only certain programs worthy of additional funding.

Prevailing presumptions are that preschool does help aid in the development of children no matter what their socioeconomic or other factors are. There is very little, if any, research to suggest that preschool has a detrimental effect. It would not be logical that additional schooling would somehow not increase educational level. There is certainly a point where there can be

oversaturation, but extending preschool to more students is not that. The argument against public preschool stems from the fact that it is not cost effective and that the money could better be spent elsewhere to improve education.

The major debate may be whether the program should be extended to one or two years of public preschool. Is there a major difference between providing four-year-olds services and three- and four-year-olds services? Is one additional year of schooling going to make the difference, or does there need to be two years for a significant impact to be shown? So far, most of the literature analyzed public preschool for four-year-olds (Karch, 2010). However, some data suggests that three-year-olds can also benefit (Blanden, 2016). This would require not only additional resources to maintain the programs, but additional resources in order for the program to come into existence. This may simply be too much of a burden for a district to handle. Making the jump to a one-year program can be an easier sell.

There are many cognitive and psychological reasons why preschool may be effective in improving the growth of children and making them more ready to succeed when they enter the actual educational realm. Studies show that students have the greatest ability to absorb information at younger ages (2013). While due to a combination of factors, the fact is that children at this age have not yet molded their minds and are beginning to grow. This makes them most susceptible to learning new things.

Children also have yet to fully form their personality or attitude by the age of preschool. This means that their attitude toward education and learning can be shaped during this critical period. If they are trained to enjoy learning and to relish opportunities for growth, this attitude can carry them for a lifetime. If instead they fall behind their peers and feel that education is not something that can benefit them, this attitude is equally likely to remain with the child for an

extended time period.

Psychologically, students benefit from the education of a public preschool program because they gain a sense of achievement early in life. Being successful in a preschool program breeds a sense of confidence that can then be carried to the next level of education, creating a cycle of success.

For the purposes of this study, it was not important to analyze these individual students, but it still led to the collective goal. Students tend to learn from peers as much as they do from traditional education. After parents, sometimes even before, peers have the largest impact on the success of a student. If peers are in the program and succeeding, the district will benefit as the other students are geared toward that success. They feed off the can-do attitude of the students who participated and benefitted from the public preschool programs leading to a tangible benefit for every student involved.

The larger framework is to establish how preschool fits into the general education frame that is constructed by the current New Jersey public education system. Is public preschool the answer to the ills that befall the achievement gap of urban education or is it simply a measure that takes away from other valuable resources? That is the ultimate question that must be answered. How can public preschool be used most effectively to close the achievement gap? It does not matter how the goal is achieved as long as it is reached. Whether it is by expansion in urban areas or suburban ones, whether it is by expanding the program to three-year-olds or only having four-year-olds. Answering this question will solve the majority of issues.

Theoretical Framework

INPUT: Variables	OUTPUT: NJ PARCC GRADE 4 RESULTS
Percentage of ELL in the district	The percentage of ELL students in a district drastically reduced its Language Arts score, however, the effect was less profound on math.
Percentage of special education in the district	The percentage of special education students did not have a profound effect on test scores.
Total enrollment	Total enrollment tended to have a negative effect on test scores, though this may be caused to larger district tending to have other factors which cause lower test scores.
Percentage of Staff With Advanced Degrees	Staff having advance degrees had a positive correlation on test scores.
Student Attendance Rate	Student attendance rates which were not statistically significant for purposes of this study.
Percentage of free and reduced lunch	The more students who were on free and reduced lunch it tended to decrease test scores.
Staff Attendance Rate	Staff attendance rate was either not available or not significant.

Chapter III

Methodology

The purpose for this correlational, explanatory, cross-sectional study was to explain the association between publicly funded preschool and factors that affect student achievement on the 2017-2018 fourth-grade Partnership for the Assessment of Readiness for College and Careers (PARCC) test results in mathematics and language arts. Privately funded programs and other programs that did not directly funnel students into the regular school district were not considered for purposes of the study. Special education programs for preschool aged children were also not considered. Districts that had preschool programs that were too new to have students who took the 2016–2017 fourth-grade PARCC test were also omitted. The unit of analysis was the district.

Research Design

A correlational, explanatory, cross-sectional design (Johnson, 2001) was used to explain the relationship that exists between the presence of a publicly funded preschool program in a New Jersey School district and the test results of mathematics and language arts on the PARCC exam. This design is appropriate to analyze associations among multiple variables. "Correlations are statistics that are used to assess the association or relationship between two variables" (Leech, Barrett, & Morgan, 2015, p.339). The correlational design is also most effective in this instance because it allows for presumptions of relationships, such as that the presence of public preschool will have an overall positive effect on student achievement.

This design allowed the researcher to examine how variables influence each other. "It is preferable to use this method when one has an idea about the order in which one wants to enter predictors and wants to know how predictions by certain variables improve on predictions by others" (Leech, et al., 2011). By using this design, it was possible to determine how different

variables would associate with each other especially when the anticipated correlation was already known.

Research Questions

Research Question 1: What factors associate with publicly funded preschool education and academic achievement in English language arts of the Grade 4 students as measured by the NJ PARCC?

Research Question 2: What factors associate with publicly funded preschool education on academic achievement in mathematics of Grade 4 students as measured by the NJ PARCC?

Research Question 3: What is the influence of district/school characteristics with a publicly funded preschool program on academic achievement in English language arts of the Grade 4 students as measured by the NJ PARCC?

Research Question 4: What is the influence of district/school characteristics with a publicly funded preschool program on academic achievement in mathematics of Grade 4 students as measured by the NJ PARCC?

Null Hypotheses

Null Hypothesis 1: No statistically significant relationship exists between publicly funded preschool education and academic achievement in ELA of fourth-grade students as measured by the PARCC.

Null Hypothesis 2: No statistically significant relationship exists between publicly funded preschool education and academic achievement in math of fourth-grade students as measured by PARCC.

Null Hypothesis 3: No statistically significant relationship on academic achievement exists between district/school characteristics and publicly funded preschool programs.

Null Hypothesis 4: No statistically significant relationship on academic achievement exists between district/school characteristics and publicly funded preschool programs.

Sample Population/ Data Source

The sample for this study consisted of public school districts within New Jersey.

A. The districts were classified as public.
B. Districts that were not charters, magnets, or other types where students were selected rather than assigned.
C. The district included preschool through Grade 4.
D. The districts reported all testing and demographic information to the New Jersey Department of Education
E. District had publicly funded preschool since at least September 2011.
F. The districts were operational during the time of the study.

The number of school districts that had complete data for inclusion was preschool to fourth grade (n=692).

The sample sizes necessary to achieve statistical significance of the regression models were calculated based on being able to identify a *p* value of at least .05 and an effect size of at least 0.50. When running simultaneous regression models, the Field formula was that the proper method of the size of the sample warranted a determination as to whether there was a statistical significance (Field, 2009). The strength of any relationship determined to warrant an analysis was determined by analyzing the standardized beta coefficients. Since Field advocated a formula of 50+8(k) (with *k* representing the number of predictor variables), and there were a minimum of ten (10) variables, the minimum number of case studies had to equal 130 to equate to an effect of at least .50 at the 95% confidence level.

When analyzing regressions, the Field formula was 104+k (p. 274). In this instance, this meant that a total of 114 cases were needed for any significance. With each subject in this study containing over six hundred (600) samples, there was a statistically significant effect (Field, 2009).

Variables

- 2018 Grade 4 PARCC English language arts percentage of students achieving Level 4 or above
- 2018 Grade 4 PARCC mathematics percentage of students achieving Level 4 or above
- Percentage of ELL students in the district
- Percentage of special education students in the district
- Total enrollment
- Percentage of students receiving free and reduced lunch
- Staff attendance rate
- Student attendance rate

Data Collection

The data for this study was retrieved from the New Jersey Department of Education's website (http://www.state.nj.us/education/reportcard/2017/index.html). The 2017 School Report Card Excel spreadsheet was downloaded and saved in a data file. Data from all public school districts were included in this study. Schools that were classified as private were eliminated from the study. Schools that did not report portions of the data were also eliminated from the study. While charter schools are publicly funded, charter schools were excluded from the study because they are selective and do not represent the general populace of a community.

Data Analysis

I started the process of analysis by first determining whether there was an assumption of normality to any of the variables. To do this, descriptive statistics were used to figure out the mathematical significance of each of the variables included in the study. I ran a model to measure skewness and ran a test of normality. Next, for any variables that did not have normal skewness, I used the Winsorizing procedure by substituting the outliers with the highest value that is not an outlier. The Winsorizing procedure reduced the skewness by ensuring all the values were within the acceptable range (Field, A.P., 2013). Then I ran a Pearson correlation matrix with all the variables to determine initial relationships and the potential for multicolinearity.

In order to create the initial and regression matrices, simultaneous regression analyses were run with the information found in Table 3.1. This helped to determine whether there was statistical significance between the variables and grade level test scores for districts fully publicly funded public preschool programs.

Pedhazur (1986) concluded, "Multiple regression also may be useful (1) in determining whether a particular effect is present, (2) in measuring the magnitude of a particular effect, and (3) in forecasting what a particular effect would be, but for an intervening event" (pp. 181-182). The models helped to show the effect that each of the variables had on language arts and mathematics test scores for fourth graders taking the New Jersey PARCC exam.

Table 3.1

Regression Models

Model 1A LAL 4th Grade	All Staff, Student and School Variables	Percentage of ELL in the district Percentage of special education in the district Total enrollment Percentage of free and reduced lunch Staff Attendance Rate Student Attendance Rate Percentage of Staff With Advanced Degrees
Model 1A Math 4th Grade	All Staff, Student and School Variables	Percentage of ELL in the district Percentage of special education in the district Total enrollment Percentage of free and reduced lunch Staff Attendance Rate Student Attendance Rate Percentage of Staff With Advanced Degrees

Instrumentation

The instrumentation used, the NJ PARCC test, tests students' reading and mathematics skills through the use of multiple-choice questions and essays and grading their success. Each student is given the same general questions in an effort to standardize the test as much as possible. The variation between questions that are asked does not create a statistical significance. While the essay questions are somewhat subjective, they follow a rigid rubric. The deviation between tests is not statistically significant. Furthermore, the difference in scoring the tests is also not statistically significant. This means that using the tests is acceptable without any further adjustments.

The test is given to all students in the state with the exception of those who either opt out or do not take the test for other reasons that can include, but are not limited to, learning disabilities for which the test cannot adapt and not being enrolled in a program that is subject to taking the test. It is uniform and does not discriminate on the basis of districts or achievement level. The test is proctored by educators and monitored by the Department of Education.

Reliability and Validity

In 2016, the reliability coefficient of the PARCC test ranged from .91 to .93 according to the Department of Education (NJDOE, 2016). For grades below Grade 6, the coefficient dipped slightly to .90, since fewer questions are asked of the students. There was a negligible difference in reliability for males and females and along socioeconomic lines. Any differences are reflected in Table 3.2.

Validity is not a major issue in regards to PARCC testing; however, the test adheres to both Common Core and universal design principles. This makes it unlikely to be susceptible to issues of validity. The evidence of universality between subsections of the test lends itself to the increase validity of the test.

Table 3.2

Fourth grade PARCC testing

Subset/Subject	Reliability Coefficient	Average Scale Score
Male/ELA	.91	11.76
Female/ELA	.91	12.27
Male/Math	.94	9.01
Female/Math	.93	9.04

Chapter IV

Results

My purpose for this correlational, explanatory, cross-sectional study was to explain the association between publicly funded preschool on the 2017-2018 fourth-grade Partnership for the Assessment of Readiness for College and Careers (PARCC) test results in mathematics and language arts. The data analyzed included achieving a level four or above on mathematics and English language arts NJ PARCC scores with students, staff, and school variables. No other tests or measures of educational standards were evaluated.

I aimed to provide research-based evidence on the influence of having a fully publicly funded preschool program and academic achievement in Grade 4 in NJ school districts. The results from the study serve to distinguish if having a publicly funded preschool program has effects on student achievement in fourth grade.

No additional research questions were added to the study as the original questions proved adequate to determine the influence of publicly funded preschools.

Independent Variables

Existing research suggest variables that influence the percentage of met expectations and exceed expectations students on the New Jersey Partnership for Assessment of readiness for College and Careers (see Table 4.0).

Table 4.0

Variables used in the study with their labels and description

Variable	Label	Description
Enrollment	Enrollment	Total student enrollment in the district
English Language Learners	ELL	Percentage of students who are not English proficient
Special Education Students	SPED	Percentage of students with disabilities
Students with low socio-economic status	FRL	Percentage of students with Free and Reduced Lunch status
Staff attendance	Staff attendance rate	Staff attendance rate
Student attendance	Student attendance rate	Student attendance rate
Publicly Funded Preschool Program	Publicly funded preschool program	If the district has a fully funded Preschool Program

Each school district in New Jersey is required to report certain statistics to the Department of Education through a report card (NJDOE). These report cards were readily available online which I downloaded into Microsoft Excel. From there, the data was sorted into a useable format that allowed for the analysis of the variables relevant to the study. No other test scores or grade levels were considered in the analysis.

Procedure

The following procedure was used to determine the significant independent variables and their relative predictive strengths. The first step was to run descriptive statistics on all variables to check data to meet assumptions for regression. This was to check all variables for normality. Normal skewness ranges from -1 to +1. The following variables did not meet normality with skewness: total enrollment and staff attendance rate. I used the Windorsizing procedure by replacing the outliers with the next highest score that was not an outlier to improve the skewness

for the variables.

Next, a Pearson correlation matrix was run with all the variables to examine initial relationships and potential multicollinarity. The first step was to run an "enter method" simultaneous multiple regression that included all seven independent variables outlined above. All the variables were run at once. The purpose of this step was to determine which of the variables were statistically significant predictors. The following statistics were noted:

1. Overall statistical significance, which was obtained from the ANOVA table
2. The R squared and adjusted R squared were used to find out which variables contributed the most to the R squared value. These values were found in the Model Summary table.
3. Beta values associated with each statistically significant coefficient were noted in the coefficients table.

Mathematics

For this study, the sample was the thirty-five (35) districts that had a public preschool program in 2012–2013 for the study. I calculated the mean and standard deviations for the dependent and independent variables used in the regression analyses. The mean for students achieving level four or five on the Grade 4 2018 math PARCC scores was about 30% of students with a standard deviation of 9.395. The mean for staff attendance was 94.522, while the mean for student attendance was 84.56875. The mean of total enrollment for the districts in this study was 8875.22. The mean for special education students was 15.493, the mean for ELL was 13.569, and the mean for Free and Reduced Lunch was 70.866. The descriptive statistics on all the variables were examined to determine if the data met all assumptions of normality for the regression analysis. Table 4.1 presents the descriptive statistics for the variables.

Table 4.1

Descriptive statistics for the variables

Variable	Mean	Min	Max	Skewness	Standard Deviation
2018 Math PARCC	29.84	16	51	.304	9.395
Total Enrollment	8875.22	199	28155	1.489	8322.67
Student Attendance	84.569	68.0	96.4	-.794	6.842
Staff Attendance	94.522	87.5	99.0	-1.049	3.1806
ELL	13.569	.50	32.9	.380	10.671
SPED	15.493	8.7	26.1	.529	4.141
FRL	70.866	37.4	99.9	-.300	17.048

I examined the results and identified that two variables did not have normal skewness. The two variables were student attendance and total enrollment. The first variable that I ran a box plot diagram for was total enrollment. It illustrated a skewness of 1.907. I found two districts of the 35 districts in the study constituted outliers in the data. The two districts that were outliers in the data were Newark with a reported total enrollment of 41,178 and Jersey with a reported total enrollment of 29,010. Since the outlier skewed the data, I used the Winsorizing procedure to replace the outlier scores with the highest value that was not an outlier, Paterson's total enrollment of 28,155. The procedure improved the skewness to 1.489. The Winsorizing procedure reduced the skewness by ensuring all the values were within the acceptable range (Field, A.P., 2013). I used the Winsorizing procedure on the other variables of staff attendance. The two districts that were outliers were Bridgeton with a reported staff attendance rate of 86.5 and Salem with a reported staff attendance rate of 84.3. Vineland was the district with the highest attendance rate that was not an outlier of 87.5, and therefore was used to replace the outliers staff attendance rate. The procedure improved the skewness from -1.363 to -1.049.

The relationship between 2018 Grade 4 PARCC mathematics percentage achieving level

four or above and percentage of ELL, percentage of SPED, total enrollment, percentage of FRL, staff attendance rate, and student attendance rate was investigated using the Pearson Correlation. There was a small negative correlation between 2018 Grade 4 PARCC mathematics percentage achieving level 4 or above and percentage of ELL in the district; however, this correlation was not significant. There was a medium negative correlation between 2018 Grade 4 PARCC mathematics percentage achieving level 4 or above and percentage of free and reduced lunch, r=-.456, n=32, p = .009. Percentage of free and reduced lunch status can explain 20.8% of the total variance of 2018 Grade 4 PARCC mathematics percentage achieving level four or above. There was also a medium positive correlation between 2018 Grade 4 PARCC mathematics percentage achieving level 4 or above and staff attendance rate, r = .404, n=32, p=.030. Sixteen-point-six percent of the total variance can be explained using staff attendance rate. Lastly, there was a medium positive correlation between 2018 Grade 4 PARCC mathematics percentage achieving level 4 or above and student attendance rate, r=. 420, n=32, p=. 017. Seventeen-point-six percent of the total variance can be explained using student attendance rate.

Table 4.2
Significance of variables on mathematics

	Percent of ELL in the district	Percent of special education in the district	Total enrollment	Percent of free and reduced lunch	Staff Attendance Rate	Student Attendance Rate
2018 Grade 4 PARCC mathematics percentage achieving level 4 or above	-.240	.035	-.012	-.456	.404	.420
Sig. (2-tailed)	.186	.848	.971	.009	.030	.017

Next, a simultaneous multiple regression was conducted that included all seven independent variables outlined above. The reported Collinearity Statistics for the model indicated no observable multicollinearity issues between the predictor variables since tolerance levels for all of the predictor variables are greater than 0.526 ($1 - R^2$).

The Model Summary for this regression analysis reports an R^2 value of 0.474, indicating the overall model can explain 47.4% of the variance in the outcome variable 2018 Grade 4 PARCC mathematics percentage achieving level four or five. An adjusted R^2 of 0.347 is reported indicating that 34.7% of the variance could be explained if the model was run using the entire population as a sample. The regression model is significant ($F[6, 25] = 3.750$, $p = 0.008$).

The Coefficient Table indicates one predictor variable contributes significantly to the explained variance of 2018 Grade 4 PARCC mathematics percentage achieving level four or five: student attendance rate ($b = 0.783$, $\beta = 0.570$, $t[34] = 3.003$, $p = 0.006$). This is the strongest predictor variable in the model explaining 65.1% of the overall variance. For every unit increase in a student attendance rate, their PARCC math proficiency score will increase by 0.783 units.

Table 4.3

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1296.049	6	216.008	3.750	.008[b]
	Residual	1440.170	25	57.607		
	Total	2736.219	31			

Table 4.4

Correlation for mathematics

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-51.660	52.872		-.977	.338
	Percentage of ELL in the district	-.66	.217	-.075	-.303	.764
	Percentage of special education in the district	.393	.443	.173	.888	.383
	Total enrollment	.000	.000	.357	1.895	.070
	Percentage of free and reduced lunch	-.220	.123	-.399	-1.782	.087
	Staff Attendance Rate	.234	.547	.079	.428	.673
	Student Attendance Rate	.783	.261	.570	3.003	.006

English Language Arts

For this study, the sample was the thirty-five (35) districts that had a public preschool program in 2012–2013 for the study. I calculated the mean and standard deviations for the dependent and independent variables used in the regression analyses. The mean for students achieving level four or five on the Grade 4 2018 ELA PARCC scores was approximately 40% of students with a standard deviation of 13.692. The mean for staff attendance was approximately 94% while the mean for student attendance was approximately 85%. The mean of total enrollment for the districts in this study was 8875.22. The mean for special education students was 15.493, the mean for ELL was 13.569, and the mean for FRL was 70.866.

Next, I calculated the descriptive statistics on all the variables to determine if the data met all assumptions of normality for the regression analysis.

Table 4.5

The descriptive statistics for all of the variables

Variable	Mean	Min	Max	Skewness	Standard Deviation
2018 ELA PARCC	40.41	17	71	.602	13.692
Total Enrollment	8875.22	199	28155	1.489	8322.67
Student Attendance	84.569	68.0	96.4	-.794	6.842
Staff Attendance	94.522	87.5	99.0	-1.049	3.1806
ELL	13.569	.50	32.9	.380	10.671
SPED	15.493	8.7	26.1	.529	4.141
FRL	70.866	37.4	99.9	-.300	17.048

I examined the results and identified that two variables did not have normal skewness. The two variables were student attendance and total enrollment. The first variable that I ran a box plot diagram for was total enrollment. It illustrated skewness of 1.907. I found two districts of the 35 districts in the study that constituted outliers in the data. The two outlier districts in the data were Newark with a reported total enrollment of 41,178 and Jersey with a reported total enrollment of 29,010. Since the outlier skewed the data, I used the Winsorizing procedure to replace the outlier scores with the highest value that was not an outlier: Paterson's total enrollment of 28,155. The procedure improved the skewness to 1.489. The Winsorizing procedure reduced the skewness by ensuring all the values were within the acceptable range (Field, A.P., 2013). I used the Winsorizing procedure on the other variables of staff attendance. The two outlier districts were Bridgeton with a reported staff attendance rate of 86.5 and Salem with a reported staff attendance rate of 84.3. Vineland was the district with the highest attendance rate that was not an outlier of 87.5, and therefore was used to replace the outliers' staff attendance rate. The procedure improved the skewness from -1.363 to -1.049.

A Correlation Table was then created to analyze the correlation between the variables and ELA percentage achieving Level 4 or above.

Table 4.6

ELA Correlation Table

	Percentage of ELL in the district	Percentage of special education in the district	Total enrollment	Percentage of free and reduced lunch	Staff Attendance Rate	Student Attendance Rate
2018 Grade 4 PARCC English Language Arts percentage achieving Level 4 or above	-.135	.116	-.022	.102	.254	.343
Sig. (2-tailed)	.438	.507	.936	.559	.184	.044

The relationship between the 2018 Grade 4 PARCC English Language Arts percentage achieving Level four or above and the percentage of ELL, percentage of SPED, total enrollment, percentage of FRL, staff attendance rate, and student attendance rate was investigated using the Pearson Correlation table. There was a small negative correlation between the 2018 Grade 4 PARCC English Language Arts percentage achieving level 4 or above and the percentage of ELL in the district; however, this correlation was not significant. There was also a small positive correlation between the 2018 Grade 4 PARCC English Language Arts percentage achieving level 4 or above and the percentage of special education students in the district, percentage of free and reduced lunch, and staff attendance rate; however, none of the correlations were significant. There was a medium positive correlation between the 2018 Grade 4 PARCC English Language Arts percentage achieving level 4 or above and student attendance rate, $r=-.343$, $n=35$, $p<.044$. Student attendance rate can explain 11.8% of the total variance of 2018 Grade 4 PARCC English Language Art percentage achieving level four or above.

Next I ran an "enter method" simultaneous multiple regression that included all seven independent variables outlined above. All the variables were run at once. The ANOVA table was used to determine the overall significance of the model. The model for the 2018 Grade 4 PARCC ELA percentage achieving Level 4 or above was not statistically significant with a significance value of .039 ($F[6, 28] = 2.602$, $p = 0.039$).

The reported Collinearity Statistics for the model indicated no observable multicollinearity issues between the predictor variables since tolerance levels for all the predictor variables are greater than 0.642 ($1 - R^2$). The Model Summary for this regression analysis reports an R^2 value of 0.642, indicating the overall model can explain 64.2% of the variance in the outcome variable of the 2018 Grade 4 PARCC mathematics percentage achieving level four or five. An adjusted R^2 of 0.220 is reported indicating that 22% of the variance could be explained if the model was run using the entire population as a sample. The regression model is significant, .039 ($F[6, 28] = 2.602$, $p = 0.008$).

The Coefficient Table indicates three predictor variables contribute significantly to the explained variance of the 2018 Grade 4 PARCC ELA percentage achieving level four or five: student attendance rate ($b = 1.030$, $\beta = 0.502$, $t(34) = 2.629$, $p < 0.001$.), percentage of free and reduced lunch ($b = .351$, $\beta = 0.459$, $t[34] = 2.175$, $p < 0.001$.), and percentage of ELL ($b = -.729$, $\beta = -.059$, $t[34] = -2.072$, $p < 0.001$.). Student attendance rate is the strongest predictor variable in the model explaining 23.7% of the overall variance. For every unit increase in a student attendance rate, their PARCC ELA proficiency score will increase by 1.030 units. Percentage of free and reduced lunch explains 16.9% of the overall variance. For every unit increase in a free and reduced lunch status, their PARCC ELA proficiency score will increase by 0.351 units. Percentage of ELL students explains 48.6% of the overall variance. For every unit increase in a

percentage of ELL, their PARCC ELA proficiency score will decrease by 0.729 units.

Table 4.7

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2684.497	6	447.416	2.602	.039[b]
	Residual	4814.646	28	171.952		
	Total	7499.143	34			

Next I used the Model Summary Table and took note of the R squared, adjusted R squared to find out which variable contributed the most to the R square. The R square value in this model was .358 and the adjusted R square was .220. This means that the independent variable is 35.8% predictive without error from the independent variable. As such, the overall variation in the percent of students achieving a level four or five is contained between 34.5% and 37.1% of the variation when using all the independent variables.

Table 4.8

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.4598[a]	.358	.220	13.113

I then used the coefficients table to note the beta values that associated with the statistically significant variables. The significance of the variables were examined in the coefficients table to identify any statistically significant variables. Student attendance rate (0.014 significance and 1.03 beta), percentage of free and reduced lunch (.38 significance and .351 beta) and percentage of ELL in the district (.48 significance and -.729) were statistically significant. This suggests that student attendance and percentage of free and reduced lunch combined with preschool positively affect student performance, whereas no amount of preschool can overcome the percentage of ELL students.

Table 4.9

Coefficients Tables for ELA

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-180.281	78.687		-2.291	.030
	Percentage of ELL in the district	-.729	.352	-.509	-2.072	.048
	Percentage of special education in the district	.763	.752	.204	1.014	.319
	Total enrollment	.001	.000	.334	1.702	.100
	Percentage of free and reduced lunch	.351	.161	.459	2.175	.038
	Staff attendance rate	1.062	.814	.223	1.305	.203
	Student attendance rate	1.030	.392	.502	2.629	.014

Overall Conclusions

After analyzing all the results together, there were some obvious conclusions that could be drawn from the overall data. Total enrollment, percentage of free and reduced lunch, and student attendance were all statistically significant variable for ELA.

Similarly for mathematic scores, only student attendance rate was statistically significant.

Research Question 1: What factors associate with publicly funded preschool education and academic achievement in English language arts of the Grade 4 students as measured by the NJ PARCC?

Null Hypothesis 1: No statistically significant relationship exists between publicly funded preschool education and academic achievement in ELA of fourth-grade students as measured by the PARCC.

The null hypothesis was rejected. A statistically significant association was found between publicly funded preschool education and academic achievement in ELA of fourth-grade

students as measured by the PARCC. The contributing factor was student attendance, though the correlation was somewhat weak.

Research Question 2: What factors associate with publicly funded preschool education on academic achievement in mathematics of Grade 4 students as measured by the NJ PARCC?

Null Hypothesis 2: No statistically significant relationship exists between publicly funded preschool education and academic achievement in math of fourth-grade students as measured by PARCC.

The null hypothesis was rejected. A statistically significant association was found between publicly funded preschool education and academic achievement in mathematics of fourth-grade students as measured by the PARCC. The contributing factors were student attendance, staff attendance, and percentage of free and reduced lunch.

Research Question 3: What is the influence of district/school characteristics with a publicly funded preschool program on academic achievement in English language arts of Grade 4 students as measured by the NJ PARCC?

Null Hypothesis 3: No statistically significant relationship on academic achievement exists between district/school characteristics and publicly funded preschool programs.

The null hypothesis is rejected. There was a statistically significant relationship. The contributing characteristics were student attendance rate, amount of free and reduced lunch, and percentage of students who were ELL.

Research Question 4: What is the influence of district/school characteristics with a publicly funded preschool program on academic achievement in mathematics of Grade 4 students as measured by the NJ PARCC?

Null Hypothesis 4: No statistically significant relationship on academic achievement

exists between district/school characteristics and publicly funded preschool programs.

The null hypothesis is rejected.

Overall, there was statistical significance between publicly funded preschool and overall district test scores in mathematics in a rejection of the null hypothesis. Student attendance was the main contributing factor.

Chapter V

Conclusions and Recommendations

Public preschool rapidly expanded in New Jersey since 2000. In the summer of 2019, New Jersey Governor Phil Murphy expanded public preschool funding to another thirty-one school districts. Once a phenomenon found mainly in the most impoverished areas of the state, public preschool is expanding into even the wealthiest of suburbs. In instituting these additional funds, New Jersey Commissioner of Education Lamont Repollet stated, "We've learned that an investment in preschool—or more accurately, an investment in high-quality preschool—has the potential to help children succeed in school, and later in life, by providing them with the academic and social skills needed for school readiness." The current political structure of New Jersey and other states view preschool as the great educational equalizer. It is only an equalizer if in fact the legislators take steps to make it effective for everyone. A preschool program that does not address the needs of students does not help. In order to maximize the potential positive effects of preschool, New Jersey officials must understand which variables are most directly affecting educational levels when it comes to preschool education. In 2018 the statewide mean percentage of students scoring proficient or above on the 2018 Grade 4 PARCC mathematics section was 49% and the statewide mean percentage scoring proficient or above on the 2018 Grade 4 PARCC ELA section was 58%.

Overview of Findings

The percentage of students eligible for free and reduced lunch, student attendance, and ELL students were the strongest predictors of ELA achievement in Grade 4 for students who attended publicly funded preschool programs. Student attendance was the strongest predictor for mathematics scores. Low levels of eligibility for free and reduced lunch and consistent student

attendance demonstrated positive correlations with ELA scores, meaning the fewer students eligible for free or reduced lunch, and the better the attendance, the better the ELA achievement was on the PARCC. Districts that enrolled fewer students eligible for free and reduced lunch had higher ELA scores. The percentage of ELL students had a negative correlation, meaning that ELL was associated with lower ELA scores in Grade 4. The correlations suggests that no amount of preschool could overcome the disadvantages associated with being poor or not speaking English as a first language when student achievement is measured by standardized test scores in Grade 4.

Conclusions

The inability of preschool attendance to overcome the negative influence of poverty on achievement later in school is important to understanding the findings of the study. For public preschool programs to provide benefits beyond Grade 3 they must realize that economic status is what drives education above most else. Congress recently increased funding for Head Start, which is a program that emphasizes necessities like providing access to meals for students (Bauer, 2019). However, Head Start may not prove as effective as previously thought. That is why, as noted in earlier chapters, the academic gains made by students who attended Head Start generally fade out after Grade 3. Education Professor Christopher Bailey argued that the effects of Head Start are completely gone by the time students reach middle school (Bailey, 2017) if underlying socio-economic characteristics of the students have not changed. This he attributes to the fact that despite its goals such as providing meals and early training, it does not provide the out-of-school factors that influence academic achievement on standardized tests.

This opinion is also shared in part by Chloe Gibbs at the Center for Poverty Research at UC-Davis. While even arguing that Head Start had several notable social improvement scores,

the academic achievement drastically decreases as students move through the grades (Gibbs, 2016). Preschool impact washes out over the years because of the disadvantages and debilitating effects of poverty.

In writing about the links between poverty and education, Scherrer (2014) explained that access to more resources alone is the not the answer for students from poverty. Students from poverty cannot make full use of the resources because of the debilitating effects associated with poverty. For example, he argued that if students are given access to tutoring and lessons, but have no way to get those experiences because of transportation issues, they are not helpful. The value then must be placed on the ability of the individual to utilize a resource, termed *resource capabilities*, rather than the resource itself. Access is not enough. All children must be able to make full use of that access.

Scherrer's resource capabilities perspective helps in part to explain why preschool itself is not able to overcome poverty. Expending more money on preschool while not simultaneously addressing the root causes of under-achievement will not improve education. If students are still struggling with other issues that poverty causes, simply having a preschool is not the solution. This is why following Scherrer's suggestions, preschool may at some point be able to overcome poverty if it is used in a way which better converts this asset into a useable resource.

Recommendations for Policy

Poverty Reduction

The evidence suggests that poverty is an inhibiting factor to students achieving their full academic potential on a large scale. Various aspects of poverty make themselves seen via food insecurity, housing insecurity, chronic absenteeism, stress, illness, and other chronic problems. For example, there is some evidence that proper nourishment is key to education (CDC, 2015).

According to the National Risk Youth Behavior Society, 46% of all students who ate a healthy breakfast seven days a week had an A grade average. This compares with 19% of those same students having mostly Ds and Fs. However, this is simply a larger projection of economic status and life conditions. This study did not break down for free and reduced lunches; wealthier children were more likely to eat healthier meals and therefore be able to benefit under the parameters of this study. Economics, not healthy eating, remains the main driving of educational success.

Failure to learn the most basic of educational skills harms students in a variety of ways. Many students test poorly in mathematics not only because of poor math skills, but poor ELA skills, which are so poor they cannot read and understand the mathematics test questions. Some of the policy recommendations for these students fall outside of the traditional educational realm. The Children's Defense Fund has suggested that while child poverty has fallen since 1967, there are still ways to reduce poverty and increase education (CDF). This includes things such as better work training programs for adults with children and increasing the earned income credit for childcare. They also recommend a larger social safety net to make sure that students' basic needs are met. When students do not have to worry about where their next meal is coming from, it adds to the ability to focus on education rather than basic survival needs.

Student Attendance

Students can benefit from attending school even if they do not pick up any skills aside from being around other children. The improvement in language skills can be directly attributed to having more interaction with children, faculty, and staff. Socioeconomic conditions often produce a substantial word gap, even if scholars disagree on just how large that gap is (Colker, 2014). Simply being exposed to other students can improve the ability of students to increase

their vocabulary. The attendance rate factor is also important because it shows that receiving consistent instruction can improve test scores.

Recommendations for Practice: What Should Principals Do?

Improving school attendance can occur by improving the connection between the school and the community. School leaders should focus on improving economic factors and increasing family involvement by helping to connect families to social services. Things such as rewarding students for attending class and assigning staff to follow up with parents can also improve student attendance (Epstein, 2002). Epstein noted that the most effective method to improve attendance was sending staff to meet with families. However, this can be prohibitively expensive for some districts. But schools can still use telephone communication to create connections between the school and home.

New Jersey should provide additional funding to impoverished districts to help improve attendance. Currently, some districts simply lack the funding necessary to do things that will improve student attendance like have enough staff to provide one-on-one meetings with students and parents. The programs would almost pay for themselves with increased educational rates and eventually a lower reliance upon social welfare programs.

Staff attendance had a small relationship to student achievement. As such, maintaining high staff attendance could help to improve student attendance because students will feel a strong connection to their educators. This will create an environment where students are better equipped for success and more focused. Educators must be rewarded for improved attendance standards. Districts should also be able to take adverse actions to educators who are absent more often than allowed without substantial reason. This is not to suggest valid absences like maternity or sick leave should be frowned upon, but educators who are taking excessive personal

days must be docked. If students do not have their educators they are not learning.

The North Central Comprehensive Center recently completed an in-depth study on absenteeism in education. They noted that 27% of teachers missed ten or more days in the 2013–2014 school year alone (NCCC). The study found a direct correlation between educator absenteeism and poorer performance among students. Their recommendations for fighting absenteeism was a positive rewards system such as matching 401(k) contributions for educators who had perfect attendance. They also suggested other measures such as requiring absences to be reported face-to-face and allowing sick days to bank and carry over, reducing the incentive of educators to use all their sick days or lose them.

Principals should work to provide more ELL instruction and supports for students who need them. There is also a necessity in some instances to improve the way in which ELL classes are taught (Genesse, 2012). Researchers argue that many of the students need programs that teach more conceptual language topics rather than rote grammar. This will allow a natural progression that can improve their overall understanding. It is obvious that students will struggle to improve in test scores when they cannot read the tests.

These substantive ideas are great policy suggestions but there is a larger overall picture that must also be looked at. Education is a community effort. No one teacher or individual can improve educational standards for a child. There is a limited range to how much a district can influence the home life of a student; however, attempting to connect with whatever this home life may be can prove a significant factor in improving test scores.

Recommendations for Spending: Production Function Theory

In the theoretical framework of this project, the production function theory was discussed as measuring how much is received from what is being put in (Hanushek, 2008). This is an

important policy consideration for any district to make. There is simply a point where more funding will not equate to a proportional amount of success. The first money put into a project will always get the greatest return and a diminishing return will come from there.

School district should not simply sink unlimited funding into preschool. There is a definite benefit for districts without preschool to begin implementation; however, there is a limit to how much should be spent. Especially with Head Start fade issues and other research suggesting that the overall returns may be limited, injecting a healthy dose of skepticism and prudence with taxpayer dollars is needed for implementing preschool.

Recommendations for Future Research

Future research could include:

- Expand the study to include newer districts that have instituted preschool
- Track students farther along in the future and review things like public preschool and graduation rates
- Design a study that tracks teacher retention rates within a district with a preschool program and educational progress of students
- Replicate this study and have public preschool programs analyzed for their effect on additional variables such as educational level of parents and availability to healthy food at home
- Expand the study to do a comparison and analysis of districts that have a fully publicly funded preschool program compared to similar districts that do not

Conclusion

When formulating educational policy, data is a policy maker's best friend. This study has made a determination that districts that have public preschool can improve those programs by

attempting to improve economic conditions and staff attendance rates. Districts should take the advice offered above to implement policies that reflect the need to improve these areas. The rapid expansion of preschool will only be effective if done in a way which maximizes its effectiveness for all students.

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