

Texas A&M University-Commerce

A&M-Commerce Digital Commons

Honors Theses

Honors College

Spring 4-17-2018

Full Day Preschool Math Achievement

Denise Calixto

Follow this and additional works at: <https://digitalcommons.tamuc.edu/honorsthesis>



Part of the [Early Childhood Education Commons](#)

Recommended Citation

Calixto, Denise, "Full Day Preschool Math Achievement" (2018). *Honors Theses*. 111.
<https://digitalcommons.tamuc.edu/honorsthesis/111>

This Honors Thesis is brought to you for free and open access by the Honors College at A&M-Commerce Digital Commons. It has been accepted for inclusion in Honors Theses by an authorized administrator of A&M-Commerce Digital Commons. For more information, please contact digitalcommons@tamuc.edu.

Full Day Preschool Math Achievement

An Honors Thesis

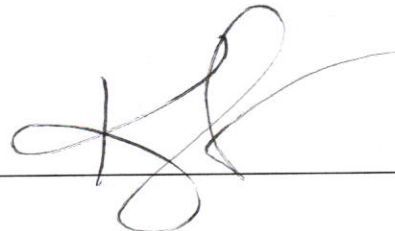
Denise Calixto

Submitted to the Texas A&M University-Commerce Honors Committee in partial fulfillment of the Program of Honors Study leading to the degree of Bachelor of Business Administration in Accounting

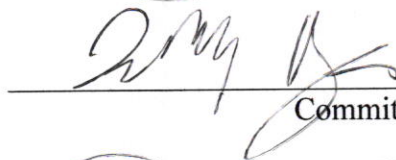
Directed by
Kelly Carrero
Assistant Professor
Psychology, Counseling, & Special Education

4/17/18

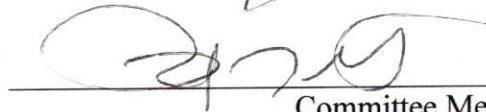
Approved:



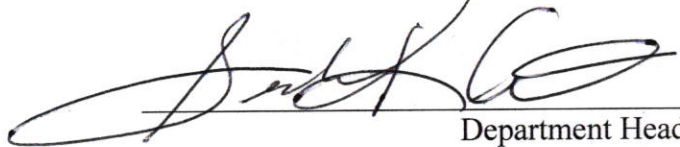
Advisor



Committee Member



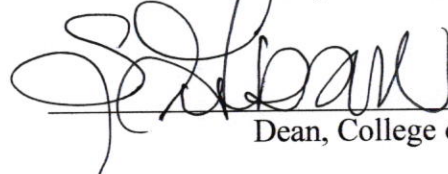
Committee Member



Department Head



Dean, The Honors College



Dean, College of Business

Full Day Preschool Math Achievement

Denise Y Calixto

Texas A&M University Commerce

CHAPTER I

INTRODUCTION

Preschool programs are not compulsory in a child's education like kindergarten – 12th grade are. They have had to prove their effectiveness, importance, and need in school readiness and academic outcomes in order to receive government funding (Schweinhart, 2014). Emerging research from Reynolds indicates that full day preschool programs accelerate kindergarten readiness in a number of different groups of children (Reynolds, Richardson, Hayakawa, Lease, Warner-Richter, Englund, Ou & Sullivan, 2014). The study also indicates that those who receive the greatest benefit from preschool programs are children classified as economically disadvantaged, English Language Learners (ELLs), or identified with disabilities.

Recent research has indicated that full day preschool programs have helped accelerate the kindergarten readiness of young disadvantaged children. The Reynolds et al. (2014) study found that full day preschool programs prepared students with school readiness skills in social-emotional development, language, math, and physical health. Furthermore, children who attended the full day preschool program had high attendance rates and very few students were chronically absent.

Statement of the Problem

The real problem is that children living in poverty are not making adequate academic achievement when compared to their peers who are not living in poverty (Dearing, McCartney, & Taylor, 2009). While early intervention is helpful (hence Title 1 funding for Head Start), students in poverty still lag behind their peers. Despite these

academic lags some schools continue to offer half day vs. full day preschool. The question is: does more school really mean more achievement?

Purpose of the Study

The purpose of this study is to examine mathematic achievement data from preschool students attending high-quality preschool programs in a local school district. The intention is to investigate and determine whether young children in full day preschool programs are more prepared for kindergarten in the area of math than their half day preschool counterparts. The participants are matched samples, but some received full day preschool and some received half day preschool.

Research Objectives

The research objectives guiding this study are:

1. Describe the demographic of the participants.
2. Determine if full day preschool has a direct effect on mathematic achievement.
3. Determine if mathematic achievement differs when focusing on limited English proficiency status for both preschool programs.
4. Determine the impact of each preschool program for students with identified disabilities.

Significance of the Study

To inform the literature regarding whether more preschool programming results in academic gains, particularly in the area of math achievement.

Limitations

This study will be limited in scope to preschool students attending a large urban district in the Southern United States . This is a local study, and thus may not apply to all preschool programs.

Definition of Terms

Battelle Developmental Inventory (BDI). “An early childhood instrument based on the concepts of developmental milestones. (Houghton Mifflin Harcourt, 2017).

Early Childhood Longitudinal Study (ECLS). “It is a multisource, multimethod study that focuses on children’s early school experiences” (Tourangeau, Nord, Sorongon, Hagedorn, Daly & Najarian, 2015).

English Language Learners (ELLs). “Students who are unable to communicate fluently or learn effectively in English, who often come from non-English-speaking homes and backgrounds, and who typically require specialized or modified instruction in both the English language and in their academic courses” (“Hidden Curriculum”, 2014).

Individuals with Disabilities Education Act. “A law that makes available a free appropriate public education to eligible children with disabilities throughout the nation and ensures special education and related services to those children” (U.S. Department of Education, 2004a).

CHAPTER II

LITERATURE REVIEW**Full Day Preschool**

High quality preschool benefits all children with or without disabilities (Dearing, McCartney, & Taylor, 2009; Hill, Gormley, & Adelstein, 2015; Yoshikawa et al., 2013). These preschools require their teachers to have a bachelor's degree, and a certification in early childhood education (Yamamoto & Li, 2012). Additionally, the classroom sizes cannot exceed 20 children, and they cannot exceed the child to staff ratio of 10:1. Also, any decisions that are made regarding the curriculum are done at the class or school level. Parents who decide to enroll their children in high quality preschool programs can expect to find high quality teachers, small class sizes that allow for more interaction with the teacher, warm social environments, and an intellectually stimulating environment. To eliminate educational disparities between children that may cause dropouts or retentions, it is necessary to target them before they reach kindergarten entry level because it prepares the student to be more equipped to learn (Ansari & Winsler, 2014; Winsler et al, 2012).

In general, preschool programs help expand school readiness. Recent research has indicated that there are many benefits in preschool programs. In a Gormley Jr., Phillips, and Gayer (2008) study that administered three subtests, it was found that the full day preschool program actually improved students' cognitive development. One subtest measured pre-reading skills; another dealt with pre-writing skills, and the last one

measured pre-math skills. The study concluded that early childhood education could eliminate the negative effects of family and environmental risk factors.

Kindergarten Readiness in the Area of Math

The Texas Prekindergarten guidelines are built on scientific research about how children progress and learn. They are a reflection of the agreement between early childhood professionals that a greater emphasis should be based on conceptual learning, acquirement of basic skills, and participation in pertinent learning experiences. In the subject of math, the professionals agree that students need to expand their ability to problem solve and gain basic skills. The skills learned by prekindergarten students are divided into categories. The skills are split into counting, adding and subtracting, geometry and spatial sense skills, measurement skills, classification and patterns (Texas Education Agency, 2015).

Challenges for economically disadvantaged young children.

In order to ensure that all children have a fair and equal opportunity to receive a high quality education, the United States has imposed Title 1– a federal regulation that is charged with the purpose of improving the academic achievement of children that have a disadvantage (e.g., children in poverty, ELLs) (U.S. Department of Education, 2004b). Title I makes sure that the school material used for teaching and testing aligns with the challenging standards set by the state. Furthermore, Title I ensures that the needs of poor or minority children are met, including those of children with identified disabilities. Finally, Title I is tasked with closing the gap between low and high performing students.

As stated by the National Center for Educational Statistics in 2007, the United States had 10.8 million school-aged students who had a home language that was not English (Lindholm-Leary, 2014). These students make up about 20% of all students in the United States. Additionally, 5% of students have difficulty speaking English. Out of all these ELLs, Hispanic/Latino children make the majority of the group of students considered to have difficulty speaking English. Lindholm-Leary identifies a key factor associated with this challenge for Hispanic/Latino children. The factors identified is that many of the children live in poverty.

According to the United States Census Bureau, there has been a slight decrease in the rate of young children who are considered to be living in poverty (Semega , Fontenot, Kolla & U.S. Census Bureau, 2017). However, the numbers are still alarming. The census results demonstrate that 18% of young children are deemed to be poor. The hardship of being poor affects the early development of children, which has led to an increase risk in school failure (Ansari & Winsler, 2014). The risk is a direct result of the gap between children that are economically disadvantaged to those that are not. Once the gap is established during the early childhood, it is hard for children to catch up to their more affluent peers (Ansari & Winsler, 2014; Reardon, 2011). The disparities in the outcomes between economically disadvantaged children and their economically more affluent counterparts were obvious in categories such as verbal ability, developmental skills, number knowledge, and hyperactivity (Kohen & Guèvremont, 2014).

Kindergarten students who are ELL encounter some struggles that inhibit them from having the same readiness as students whom English is their first language

(Sonnenschein & Sun, 2017). A study based on the data provided by Early Childhood Longitudinal Study-Birth Cohort found that on average Latino students were not kindergarten ready when it came to their math skills. They scored 25-50% lower than the other students. It is reasoned that this may be based on cultural differences.

According to the Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K:2011), a nationally representative sample of approximately 17,000 kindergarten students in the United States, Bernstein, West, Newsham, and Reid (2014) found that students with more risk factors struggled more in kindergarten. They identified four risk factors. Two of which were students living below the poverty line and students who had a home language different than English.

Since the passing of the *Education for all Handicapped Children Act* of 1975, now known as the *Individuals with Disabilities Education Act*, children with disabilities have been able to attend public schools for free alongside their peers (U.S. Department of Education, 2004a). IDEA allows children to get an education while learning in the least restrictive environment. In a study of Tulsa, Oklahoma's preschool programs, it was concluded that preschool programs show a positive relationship related to kindergarten readiness in children with identified disabilities (Phillips & Meloy, 2012). In the case of children with mild disabilities, it was found that they benefit from inclusion. Their social development skills are greater compared to children with disabilities who have not experienced inclusion in classroom settings. Moreover, a study in Montgomery County, Maryland demonstrated that children who attended school at an early age made more progress in the *Battelle Developmental Inventory* than those who received the same

services at home or in a therapeutic environment (Phillips & Meloy, 2012). In addition, the study compared the progress of students with disabilities who attended a full day preschool program to those that attended a half day program. The results indicate that attending a full day preschool program provided higher levels of developmental improvement in children with disabilities. However, one should consider that Oklahoma's preschool programs all require their teachers to have extensive education while most teachers in other preschool programs are not trained in special education.

CHAPTER III

METHODS

This study compares mathematic achievement data from preschool students attending full day and half day high-quality preschool programs in a large urban school district in the Southern United States. The research objectives guiding this study are:

1. Describe the demographic of the participants.
2. Determine if full day preschool has a direct effect on mathematic achievement.
3. Determine if mathematic achievement differs when focusing on limited English proficiency status for both preschool programs.
4. Determine the impact of each preschool program for students with identified disabilities.

The design for this research is based on secondary data analysis with the statistics being obtained from a very large school district data set. For this study, a repeated measured design is implemented meaning that we are looking at growth over three different points of time. The data were collected at the beginning of the year, middle of the year, and at the end of school year. Participants all qualify for free and reduced lunch (i.e., available for children from low socioeconomic households), some are ELL, some are in Spanish-speaking preschool classes, some have identified disabilities, and some get full day schooling while others receive half day.

The study will consist of 962 prekindergarten students of which 711 (74%) are in the half day program, and 251 (26%) students are in the full day program. The study will

look at different categories such as limited English proficiency (LEP) status and whether they have been identified with a disability. Overall, ethnicities are split into Asians 273 (28%), African Americans 121 (13%), Hispanics 399 (41%), Two or more races 20 (2%), and Whites 149 (15%). As for LEP status, 373 (39%) students are proficient in English; 347 (36%) students are in English as a Second Language (ESL) classes, and 238 (25%) students are taking bilingual education classes. Students identified with a disability consist of 209 (22%), and students not identified with a disability are 753 (78%).

These students will be taking achievement/benchmark tests at three points throughout the school year. The results from the mathematical section of the tests were collected to monitor student progress and were be used as indicators of success for the preschool programs. The data were collected last year by the school district and will be analyzed using multivariate analysis of variance (MANOVA) with repeated measures. This analysis was selected because the data involves more than one dependent variable and were collected at three different points in time.

CHAPTER IV

FINDINGS

The information provided in chapter 2 explained the challenges faced by kindergarten students and the expectations of their kindergarten readiness. In chapter 3, a description of the methodology included: design of the study, collection, and analyses. The purpose of this study was to investigate the academic impact of preschool programs by comparing half and full day preschool programs. The current study focused specifically on math achievement, and how each program impacts it. The aim of this study was to determine which program had the most positive impact on math scores. To answer objective one, demographic information was collected. The data were collected from the students' benchmark tests. The assessments administered were the Center for Improving the Readiness of Children for Learning and Education (CIRCLE) Progress Monitoring System, which evaluated shape naming and discrimination, counting skills, operations, and number identification (CLI Engage, 2017). The data from the tests was reviewed using SPSS, a program that offers advanced statistical analysis, and analyzed through MANOVA with repeated measures. The results will be reported in this chapter according to the following research objectives:

1. Describe the demographic of the participants.
2. Determine if full day preschool has a direct effect on mathematic achievement.
3. Determine if mathematic achievement differs when focusing on limited English proficiency status for both preschool programs.

4. Determine the impact of each preschool program for students with identified disabilities.

Participant Demographics

The first research objective was devised so that the researcher could identify the demographic of the preschool students. The demographic information collected were ethnicity, Limited English Proficiency (LEP) status, if the student had been identified with a disability, and the preschool program the student was enrolled in.

For the study, there were a total of 962 prekindergarten students and most of them attended the half day program (see Figure 1). The ethnicity groups are Asians, African Americans, Hispanics, Whites, and students of two or more races. The break down of the ethnicities is Asians ($n = 273$; 28%), African Americans ($n = 121$; 13%), Hispanics ($n = 399$; 41%), two or more races ($n = 20$; 2%), and Whites ($n = 149$; 15%). LEP status breakdown for participants is students proficient in English ($n = 373$; 39%); students in ESL classes ($n = 347$; 36%), and students taking bilingual education classes ($n = 238$; 25%). A look at students with identified disabilities demonstrates that almost a quarter of students ($n = 209$; 22%) are considered to have a disability.

In the half day program, there were students from different ethnicities which consisted of Asians ($n = 249$; 35%), African Americans ($n = 79$; 11%), Hispanics ($n = 248$, 35%), Whites ($n = 119$; 17%), two or more races ($n = 16$; 2%) (see Figure 2). In the full day program, ethnicity groups were made up of Asians ($n = 24$; 10%), African Americans ($n = 42$; 17%), Hispanics ($n = 151$; 60%), Whites ($n = 30$; 12%), Two or more races ($n = 4$; 2%) (see Figure 2).

Another category students were divided into was by their LEP status. The study included students proficient in English, some taking ESL classes, others in Bilingual Education (BE), and students denied admission (DEN) to ESL or BE classes because their English proficiency passed the level needed (see Figure 3). In the ESL classes, students were taught only in English, but at a steady pace they could learn at. The BE classes offered by the school district allow students to learn in their native language and in English. However, these classes are only limited to the Spanish speaking student population. Overall, students proficient in English in the half day program were 275 (39%); ESL students amounted to 292 (41%), 116 (16%) of students were in BE classes, and 1 (<1%) student of DEN LEP status. In the full day program, participants were split into ENG, BE, ESL, and DEN respectively: ($n = 98$; 39%), ($n = 95$; 38%), ($n = 55$; 22%), ($n = 3$; 1%).

Lastly, students were divided by whether they had been identified with a disability. In general most students were not diagnosed with an identified disability (see Figure 4). In the full day program, 28 (11%) participants were identified with a disability and 223 (89%) were not. As for the half day students, 181 (25%) were identified with a disability and 530 (75%) were not.

Figure 1

Student Participation by Program Type

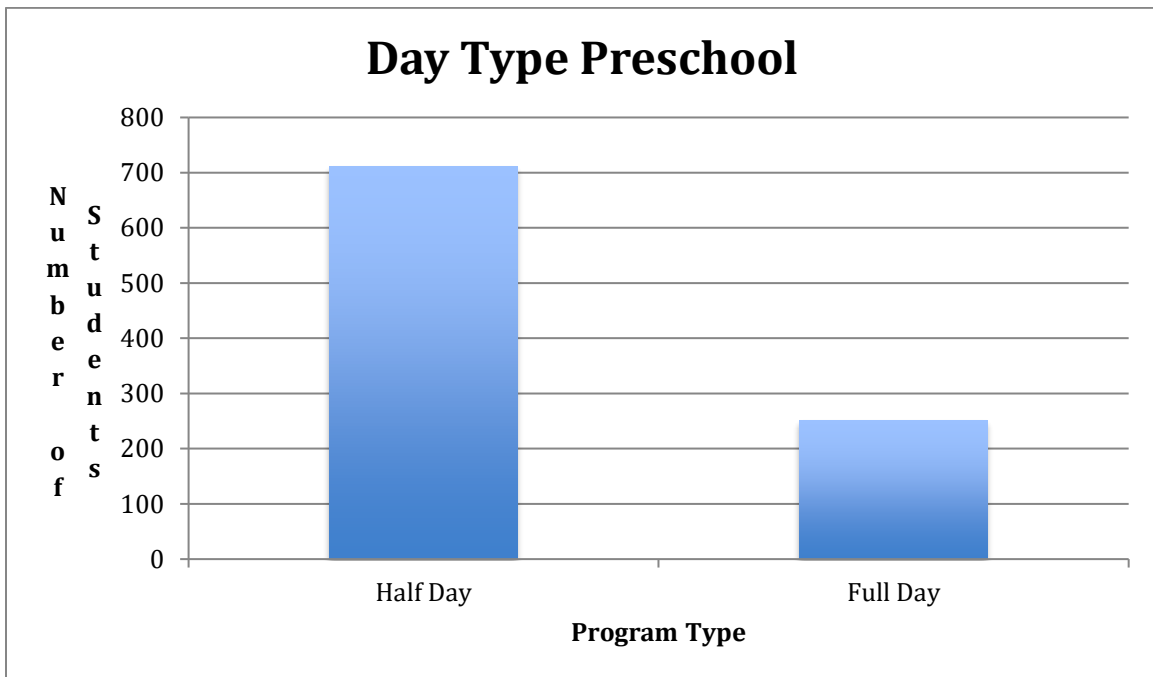


Figure 2

Ethnicities by Program Type

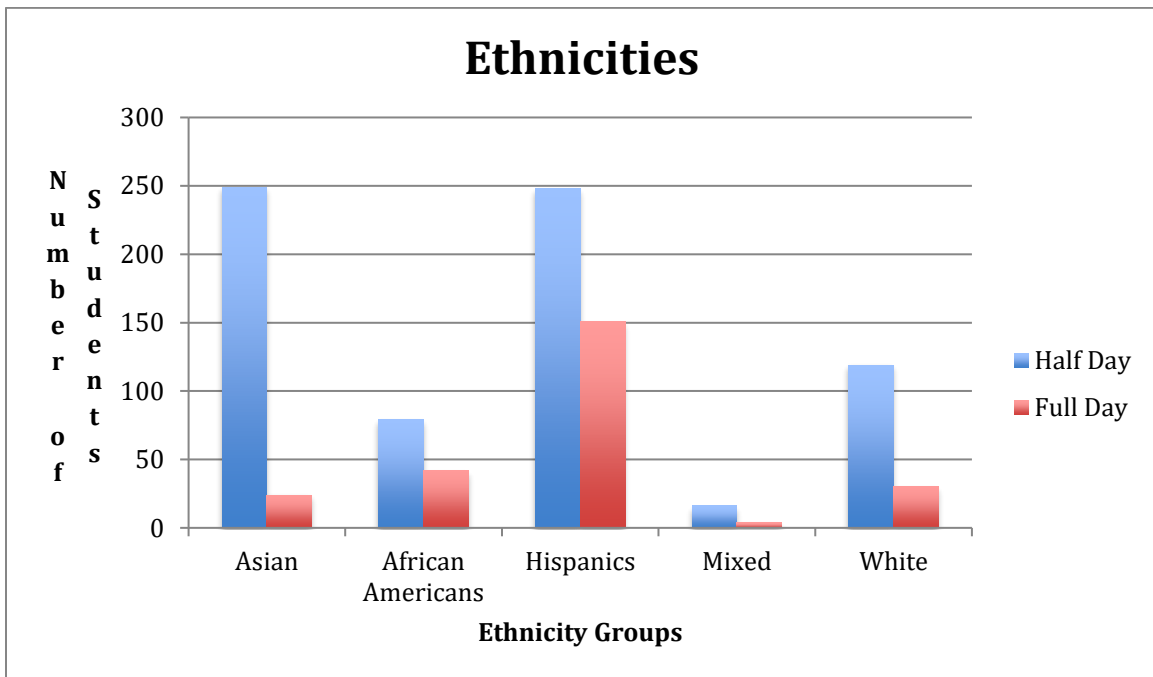


Figure 3

LEP Status by Program Type

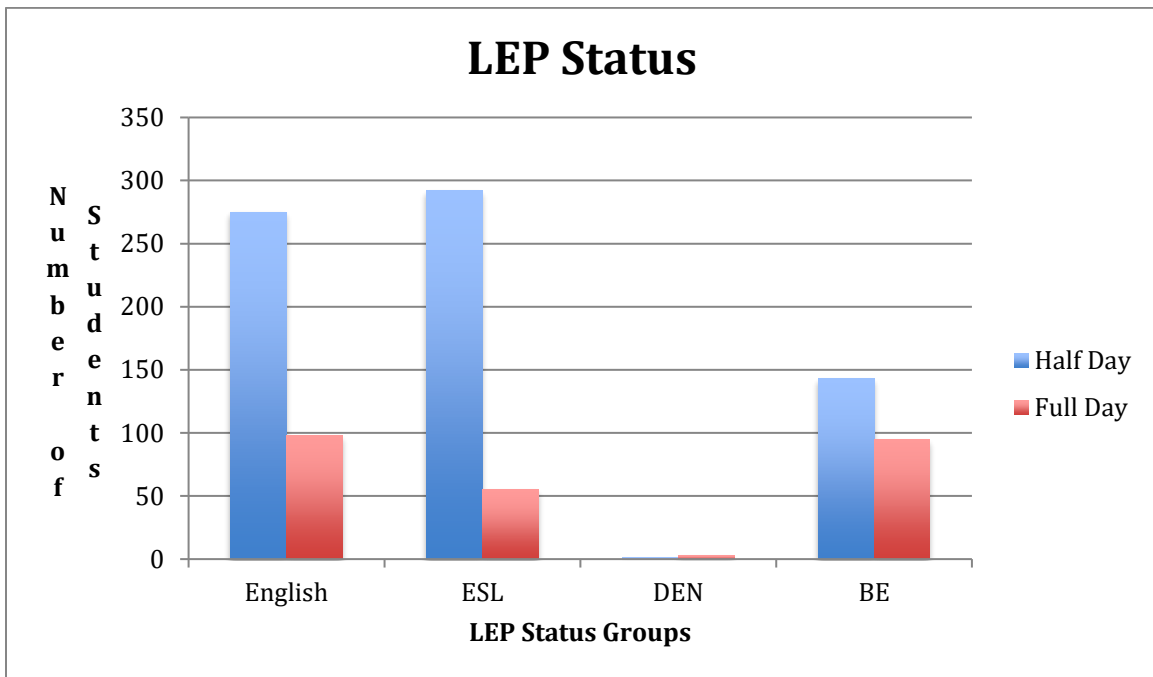
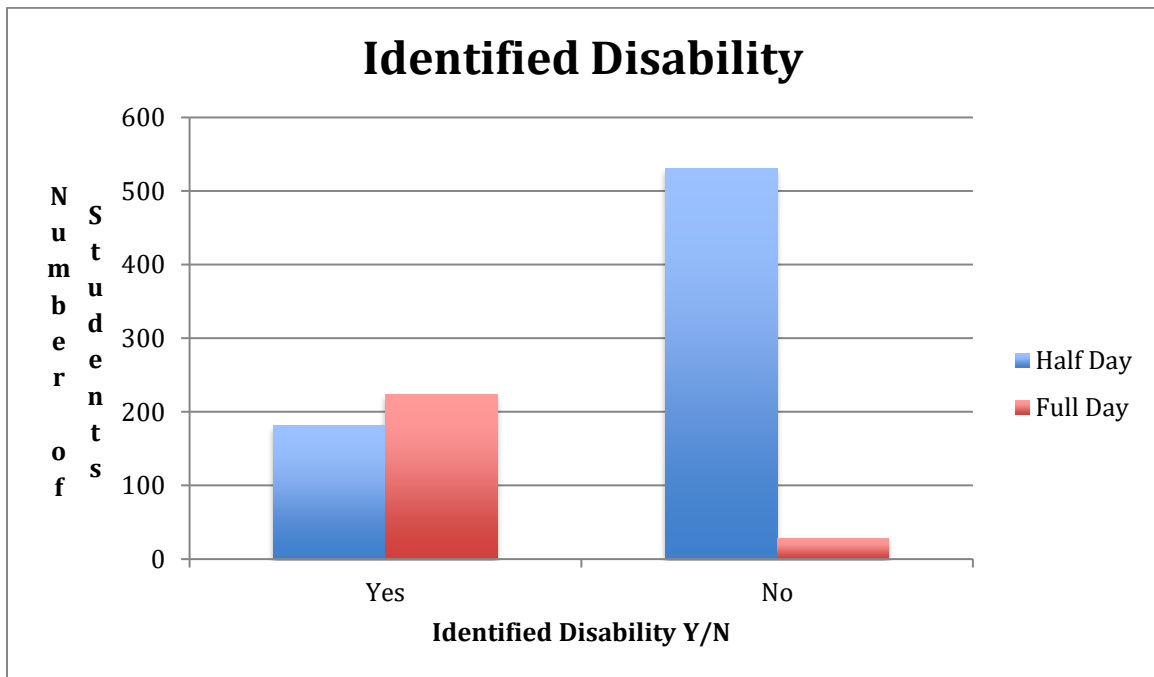


Figure 4

Identified Disability by Program Type



Mathematic Achievement Between Full Day and Half Day Preschool

Research Objective Two was devised to determine the academic impact between the half day and full day program. The dependent variables used were the tests scores on each test from the CIRCLE Progress Monitoring System, and the independent variables were the preschool program the students were enrolled in. Based on values in Table 1, the first test demonstrated a higher average score in students enrolled in the half day preschool program. Half day showed an average score of 15.55 while full day showed and average score of 14.22. However, by the time the second test was taken during the

middle of the school year, full day students had achieved a higher average score and had more improvement than half day students. Their average score was 22.32, and half day had an average score of 22.09. Table 1 provides a basic summary of the information obtained in the analysis.

Table 1

Descriptive Statistics for Math Scores by Program Type

	Day Type	Mean	Std. Deviation
Math Wave 1	Full Day	14.22	5.944
	Half Day	15.55	6.879
Math Wave 2	Full Day	22.32	4.580
	Half Day	22.09	5.444

Note. Math W1 = test at beginning of school year Math W2 = test at middle of school year

To test whether the MANOVA was statistically significant, the Multivariate Tests (see Table 2) was used. By looking at the Wilks' Lambda row and the statistical significance column, it can be determined that the data is dependent on the preschool program. Statistical significance value is .000, which means $p < .0005$ (see Table 2). Based on results from Table 2, it is evident that significant interaction does exist.

Table 2

Multivariate Tests for Wave and Program Type

Effect		Value	F	Hypothesis df	Error df	Sig.
Wave * Day Type	Pillai's Trace	0.21	21.085	1.000	960.000	.000
	Wilks' Lambda	.979	21.085	1.000	960.000	.000
	Hotelling's Trace	.022	21.085	1.000	960.000	.000
	Roy's Largest Root	.022	21.085		960.000	.000

Mathematic Achievement for LEP Status by Program Type

To determine if mathematic achievement differs when focusing on LEP status for both half day and full day preschool programs. For this objective, the program type the student was enrolled in splits the math scores. Then, they are further split based on the LEP status for each student. Reviewing Table 3 shows that at the beginning of the year, students in half day ESL scored an average higher score than all the other groups in their program. Their score in the full day program was a 14.89. The half day ESL group averaged a 17.35. On the other hand, the full day program showed that students proficient in English scored a higher average than the other groups in their program. However, half day ESL students managed to score higher with an average of 17.35 while full day English students had an average of 16.31. On the second test, the results were quite similar. Students in half day ESL averaged a higher score (23.51) than all the other groups in both programs

Table 3

Descriptive Statistics for LEP Status by Program Type

	Day Type	LEP Status		
Math Wave 1	Full Day	ENG	16.31	5.140
		BE	11.64	5.767
		DEN	15.33	8.737
		ESL	14.89	5.940
	Half Day	ENG	16.16	6.420
		BE	10.71	5.977
		DEN	15.00	--
		ESL	17.35	6.642
Math Wave 2	Full Day	ENG	22.59	4.310
		BE	22.40	4.736
		DEN	21	6.245
		ESL	21.76	4.765
	Half Day	ENG	21.24	5.701
		BE	20.86	5.547
		DEN	15.00	--
		ESL	23.51	4.804

Table 4 demonstrates that there is a significant difference in math between half day and full day preschool programs. In the context of LEP status, there is a significant difference in math achievement between half day and full day preschool programs (see Table 4). Specifically, half day English averaged a significantly greater score than half

day BE. Their difference is calculated at 2.91. Looking at half day ESL, they were also significantly greater than half day BE with a difference of 4.64. However, half day BE was significantly less than full day English. The difference between half day BE and full day English is 3.66. As for the full day program, full day English was significantly greater than full day BE with a difference of 2.43.

Table 4

Post Hoc Results for LEP Status by Program Type

	M Diff	Sig.
Half Day Eng > Half Day BE	2.91	.000
Half Day ENG < Full Day ENG	-.75	.230
Half Day ESL > Half Day BE	4.64	.000
Half Day BE < Full Day ENG	-3.66	.000
Half Day BE < Full Day BE	-1.23	.079
Full Day ENG > Full Day ESL	1.12	.209
Full Day ENG > Full Day BE	2.43	.001

Mathematic Achievement for SPED by Program Type

The final research objective was designed to determine the impact made on math scores by each preschool program for students with identified disabilities. The table splits children by program type. The next sublevel is whether the students have been identified with a disability. In reviewing Table 5, it is seen that students with an identified disability

make a larger improvement in their math scores when they are enrolled in the full day preschool program. In the first wave, their average score was calculated at 14.43.

However, by the second wave, the average score had increased to 21.61. On the other hand, half day students scored a 14.93 in the first wave and a 22.82 in the second wave.

Hence, the scores for students in the full day program show an advancement of 7.18 compared to half day students who had a change in their average of 5. Table 5 shows a detailed listing of mathematic scores for each group.

Table 5

Descriptive Statistics for Special Education by Program Type

	Day Type	Special Educ.	Mean	Std. Deviation
Math Wave 1	Full Day	No	14.19	6.048
		Yes	14.43	5.131
	Half Day	No	15.76	6.915
		Yes	14.93	6.754
Math Wave 2	Full Day	No	22.41	4.563
		Yes	21.61	4.740
	Half Day	No	22.82	4.948
		Yes	19.93	6.221

CHAPTER V

DISCUSSION

The purpose of this study was to determine if preschool aged children from disadvantaged backgrounds (e.g., economically disadvantaged, ELL, disability) made more achievement in the area of mathematics when they were enrolled in a full day preschool program in a large urban school district located in the southern United States. Originally, the study was to include data collected from the end of school year achievement test. However, Wave 3 data is still being submitted and prepared by the research team. Therefore, it wasn't included in the current study.

When demographic data were examined, it was determined the students in this study were highly diverse in many ways. There were a total of 962 students with a large amount in the half day program. The largest ethnicity groups in the study were Hispanics and Asians. As for LEP status, 39% were proficient in English, 36% were in ESL classes, and 25% were in BE classes. In the full day program, 89% of the students were not identified with a disability while in the half day program, 75% were not identified with a disability. Consequently, the data demonstrated a disproportionate amount of students with a disability in the half day preschool program. This could be caused by the higher amount of students in the half day program, which totaled 711 students.

Data indicate that full day students had a slightly larger average than half day students. They also made more academic gains because in the test conducted at the beginning of the school year they had a lower average than half day students. The results show that there is significant difference in math scores between half day and full day

programs and the students' LEP status. Students who are ESL and enrolled in the half day program scored higher than all the other groups in both programs at both measures in time, Wave 1 and Wave 2. This could be a direct result of students receiving more assistance because of fear that they will fall behind their peers who are proficient in English. As a result, the students actually are more thoroughly educated than those students with English proficiency.

Students with an identified disability appear to benefit more from being enrolled in the full day program. They improved more academically in their math scores than those in the half day program. The results agree with research conducted by Philips and Meloy (2012). Their research also indicates that a positive relationship exists between preschool programs and kindergarten readiness. Students appear to receive more benefit from inclusion. However, it is important to note that there is a possibility that full day students with disabilities a) may require additional special education provision, which costs a substantial amount of money, b) may not have come from economically disadvantaged homes, and/or c) their individual needs may not have been able to be met in the full day program.

Recommendations

Based on my findings on the current data provided for the beginning of the year test and middle of the year test, students receive more benefit concerning their mathematic achievement when enrolled in a full day preschool program. Their scores demonstrate a greater improvement when compared to their peers in the half day program. Hence, I would recommend enrollment for all students, particularly those

identified with a disability, in a full day preschool program. However, more analyses should be conducted once the data for the end of school year test is prepared and finalized so that it can be determined if the current results maintain the same pattern throughout the continuation of the school year, or if they experience a change.

References

- Ansari, A., & Winsler, A. (2014). Montessori public school pre-k programs and the school readiness of low-income black and latino children. *Journal of Educational Psychology, 106*(4), 1066-1079. doi:10.1037/a0036799
- Bernstein S., West J., Newsham R., & Reid M. (2014). *Kindergartners' skills at school entry: An analysis of the ELCS-K*. Princeton, NJ.:Mathematica Policy Research
- CLI Engage. (2017). *CIRCLE Progress Monitoring System (PreK)*. Retrieved from <https://cliengage.org/public/tools/assessment/circle-progress-monitoring/>
- Dearing, E., McCartney, K., & Taylor, B. (2009). Does higher quality early child care promote low-income children's math and reading achievement in middle childhood? *Child Development, 80*(5), 1329-1349.
- Gormley Jr., W. T., Phillips, D., & Gayer, T. (2008). Preschool programs can boost school readiness. *Science, 320*(5884), 1723-1724.
- Hidden curriculum* (2014, August 26). In S. Abbott (Ed.), *The glossary of education reform*. Retrieved from <http://edglossary.org/hidden-curriculum>
- Hill, C. J., Gormley, W. T., & Adelstein, S. (2015). Do the short-term effects of a high-quality preschool program persist? *Early Childhood Research Quarterly, 32*60-79. doi:10.1016/j.ecresq.2014.12.005
- Houghton Mifflin Harcourt. (2017). *Battelle Developmental Inventory, Second Edition Normative Update*. Retrieved from <http://www.hmhco.com/hmh-assessments/early-childhood/bdi-2#scoring>

- Lindholm-Leary, K. (2014). Bilingual and biliteracy skills in young Spanish-speaking low-SES children: Impact of instructional language and primary language proficiency. *International Journal Of Bilingual Education & Bilingualism*, 17(2), 144-159. doi:10.1080/13670050.2013.866625
- Kohen, D., & Guèvremont, A. (2014). Income disparities in preschool outcomes and the role of family, child, and parenting factors. *Early Child Development & Care*, 184(2), 266-292. doi:10.1080/03004430.2013.785539
- Phillips, D.A., & Meloy, M.E. (2012). High-quality school-based pre-k can boost early learning for children with special needs. *Exceptional Children*, 78(4), 471-490.
- Reardon, S.F. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. In R. Murnane & G. Duncan (Eds.), *Whither Opportunity? Rising Inequality and the Uncertain Life Chances of Low-Income Children*. New York: Russell Sage Foundation Press.
- Reynolds, A.J., Richardson, B.A., Hayakawa, M., Lease, E.M., Warner-Richter, M., Englund, M.M., Ou, S., Sullivan, M. (2014). Association of a full-day vs part-day preschool intervention with school readiness, attendance, and parent involvement. *JAMA*. 2014;312(20):2126–2134. doi:10.1001/jama.2014.15376
- Schweinhart, .LJ. (2014). The value of high-quality full-day preschool. *JAMA*. 2014;312(20):2101–2102. doi:10.1001/jama.2014.15124

- Semega, J.L., Fontenot, K.R, Kollar, M.A, U.S. Census Bureau. (2017). *Income and poverty in the United States: 2016*. Washington, DC: US. Government Printing Office
- Sonnenschein, S., & Sun, S. (2017). Racial/ethnic differences in kindergartners' reading and math skills: Parents' knowledge of children's development and home-based activities as mediators. *Infant & Child Development*, 26(5), n/a.
doi:10.1002/icd.2010
- Texas Education Agency (2015). *Texas Prekindergarten Guidelines (Updated 2015)*. Retrieved from <https://tea.texas.gov/index2.aspx?id=2147495508>
- Tourangeau, K. Nord, C. Le, T. Sorongon, A.G. Hagedorn, M.C., Daly P. and Najarian, M. (2015) Early Childhood Longitudinal Study, Kindergarten Class of 2010– 11 (ECLS -K:2011), User's Manual for the ECLS -K:2011 Kindergarten Data File and Electronic Codebook, Public Version (NCES 2015-074). U.S. Department of Education. Washington, DC: National Center for Education Statistics.
- U.S. Department of Education. (2004a). *About IDEA*. Retrieved from <https://sites.ed.gov/idea/about-idea/>
- U.S. Department of Education. (2004b). *Title I – Improving the Academic Achievement of the Disadvantaged*. Retrieved from <https://www2.ed.gov/policy/elsec/leg/esea02/pg1.html>
- Yamamoto, Y., & Li, J. (2012). What makes a high-quality preschool? Similarities and differences between Chinese immigrant and European American parents'

views. *Early Childhood Research Quarterly*, 27(2), 306-315.

doi:10.1016/j.ecresq.2011.09.005

Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M., Espinosa, L., Gormley, W. T., Ludwig, J., Magnuson, K., Phillips, D., & Zaslow, M (2013). *Investing in Our Future: The Evidence Base on Preschool*. Washington, D.C. : Society for Research in Child Development.

Winsler, A., Hutchison, L. A., De Feyter, J. J., Bleiker, C., Manfra, L., Hartman, S. C., & Levitt, J. (2012). Child, family, and childcare predictors of delayed school entry and kindergarten retention among linguistically and ethnically diverse Children. *Developmental Psychology*, 48(5), 1299-1314. doi:10.1037/a0026985