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A Brief Report of the Missouri Assessment Program for Third Grade Students in Missouri Bootheel Schools

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Abstract

This brief analysis attempts to answer the question of the relative significance of Missouri Assessment Program Test (MAP) performance of third grade students in Missouri Bootheel schools. Research concluded there is a significant difference in the MAP scores of students who attended preschool and those who did not.

Introduction/Purpose of the Study

The purpose of this quantitative study was to do a comparative analysis of Missouri Assessment Program Test (MAP) performance of third grade students in Missouri Bootheel schools. The analysis was designed to answer the following research question: Is there a significant difference in MAP scores of third-grade students who attended publicly funded preschool programs and those who did not attend publicly funded preschool programs?

A total of 239 scores were analyzed to determine if a significant difference existed between the two groups. Data were placed in the Statistical Package for the Social Sciences program. The mean standard scores for Communication Arts and Math were compared using an Independent Samples T-Test. Finally, the researcher concluded there is a significant difference in the MAP scores of students who attended preschool and those who did not.

Numerous studies have shown that one or two years of preschool can improve a child's chances of success in school (Lang, 1994). Studies have also shown a positive relationship between achievement levels of students and preschool attendance (Harley, 1994). If a child begins school at a disadvantage, he/she will likely remain at a disadvantage. According to a study that followed 111 children from North Carolina for 21 years, those who attended preschool were less likely to drop out of school, repeat grades, or bear children out of wedlock (Starr, 2002). The North Carolina students who attended preschool were twice as likely to attend a four-year college (Starr, 2002). These statistics suggest preschool has long-term positive results for children.

Several studies show early childhood interventions, such as preschool programs, improve overall academic performance. However, little evidence has been shown that links early childhood interventions such as preschool to student performance on high-stakes assessment.

Population/Sample

Missouri's Bootheel Title I third-grade students were the study's population because third grade is the level at which initial assessment is required under the mandates of NCLB. A list of Title I eligible schools was obtained from the Missouri Department of Elementary and Secondary Education (DESE) and was cross-referenced with schools that have had Title I preschools implemented for at least five years (2005).

The Missouri Bootheel region was selected because it is an area of high poverty. Many families in the Bootheel region live with little or no income other than state funds. There are no large cities in the Bootheel with most of the area being agricultural. The median per-capita income in the Missouri Bootheel region is $24,538 with 25.6% of the population living in poverty (Southeast Missouri State University, Center for Regional History, 2007, p. 12). The free-reduced lunch percentages range from 60% to 100% for districts in the Missouri Bootheel (Missouri Department of Elementary and Secondary Education, 2007). There are 47 towns/cities and 18 school districts in the Bootheel. All 18 districts are designated as Title I schools with 11 having Title I preschools (Missouri Department of Elementary and Secondary Education, 2007).

Scores of third-grade students were gathered according to the following categories:

1. Students who attended publicly funded Missouri Bootheel Title I four year-old preschools and
2. Students who did not attend publicly funded Missouri Bootheel Title I four year-old preschools.

The Missouri Bootheel includes the counties of Dunklin, Pemiscott, and New Madrid. Eleven schools in the Missouri Bootheel have Title I preschools, out of which eight schools have Title I preschools programs that have been in operation since 2001-2002 school year (Missouri Department of Elementary and Secondary Education, 2007).

The population of this study was 477; the sample required for this population size is 214. The researcher included every other score, starting with the first score, from each of the schools' third grade rosters. Therefore, the sample for the study was scores from 239 students; 53.1% of these students attended preschool and 46.9% did not attend any type of preschool program.

Instrumentation

The Department of Elementary and Secondary Education (DESE) developed the Missouri Assessment Program (MAP) test, which became mandatory in the 1997-1998 school year, to assess a student's knowledge of The Show-Me Standards, Missouri's curriculum standards broadly defined by grade level and subject level The MAP Test assesses Mathematics and Communication Arts. The testing is divided into three sessions for each area tested. Communication Arts consists of a constructed response section, a multiple-choice section, and

writing prompt. The only portion of the test that is timed is the multiple-choice section. The Mathematics portion consists of three sections. One section is constructed response, the second is a performance event and the third is multiple-choice (Missouri Department of Elementary and Secondary Education, 2005).

Data Collection

The data collected from the school districts included in the study provided information regarding preschool attendance and MAP scores. However, the data did not contain any information that could identify individual students. Data were collected expost-facto from the school districts included in the study. Students complete the MAP test in April and test scores are available the following September.

Data Analysis and Reporting

Data analysis was reported in appropriate tables and included contrasts and comparisons of the performances of students based on their placement in groups (independent variable): (1) Students with preschool attendance, and (2) Students with no preschool attendance. Descriptive statistics were provided with regard to the variability of scores between the student groups (dependent variables) on the MAP designated performance levels and numeric scale.

Presentation of Data

The purpose of this quantitative study was to do a comparative analysis of Missouri Assessment Program Test (MAP) performance of third grade students in Missouri Bootheel schools. The analysis was designed to answer the following research question:

> Are there significant differences in MAP scores of third-grade students who attended a Missouri Title I publicly funded preschool program and those who did not attend a Missouri Title I publicly funded preschool programs?

Descriptive statistics utilizing measures of central tendency were used to compare the variability of the data relative to the subpopulations. An Independent Samples T-test procedure was used for comparing the mean scale scores of students who attended preschool and those who did not in order to determine if there was sufficient evidence to infer that the means were significantly different. A two-tailed test of significance was utilized. The level of significance was set at $p<.05$. The standard scores on the MAP test were used for data collection and analysis. The performance levels and standard scores are as follows:

Below Basic = 1 (scaled score range of 455-591),
Basic = 2 (scaled score range of 592- 647),
Proficient = 3 (scaled score range of 648-672), and
Advanced = 4 (scaled score range of 673-790).

Data Analysis

Of the 239 third grade scores in the study, 127 or 53.1 % attended a Missouri publicly funded Title I preschool, and 112 or 46.9% did not attend a Missouri publicly funded Title I preschool. Data analysis of Communication Arts MAP scores revealed 31 students or 13% scored at level 1 (standard score between 455 and 591), 131 students or 54.8% scored at level 2 (standard score between 592 and 647), 45 students or 18.8% scored at level 3 (standard score between 648 and 672), and 32 students or 13.4% scored at level 4 (standard score between 673 and 790). Table 1 depicts the frequency distribution of the MAP Communication Arts standard scores and performance level scores. The scores did tend to follow a typical bell curve form in that most of the scores were in levels two and three with smaller numbers in level one and level four.

Table 1

MAP Communication Arts Standard Score and Performance Level Score Frequencies

Performance Level/Standard Score	Frequency	Percent
Level 1/455-591	31	13.0
Level 2/592-647	131	54.8
Level 3/648-672	45	18.8
Level 4/673-790	32	13.4

Data analysis of MAP Math scores revealed 27 students or 11.3% scored at level 1 (standard score 450-567), 130 students or 54.4% scored at level 2 (standard score 568627), 68 students or 28.5% scored at level 3 (standard score 628-666), and 14 students or 5.9% scored at level 4 (standard score 667-780). Table 2 depicts the frequency distribution for MAP Math standard scores and performance level scores. The scores did tend to follow a typical bell curve form in that most of the scores were in levels two and three with smaller numbers in level one and level four.

Table 2

MAP Math Standard Scores and Performance Level Score Frequencies

Performance Level/Standard Score	Frequencies	Percent
Level 1/450-567	27	11.3
Level 2/568-627	130	54.4
Level 3/628-666	68	28.5
Level 4/667-780	14	5.9

Research Question

The purpose of this quantitative study was to do a comparative analysis of Missouri Assessment Program Test (MAP) performance of third grade students in Missouri Bootheel schools. The analysis was designed to answer the following research question:

> Are there significant differences in MAP scores between third-grade students who attended Missouri publicly funded Title I preschool programs and those who did not attend Missouri publicly funded Title I preschool programs?

Table 3 depicts the mean for MAP Communication Arts standard scores for students not attending and students attending preschool. The mean standard score for students not attending preschool is 622.82 with a standard deviation of 40.788 and a median of 623. The standard error of mean is 3.854 and a variance of 1663.680. The mean MAP communication arts standard score for students attending preschool is 639.76 with a standard deviation of 45.0150 and a median of 643. The standard error of mean is 4.006 and a variance 2038.503.

Table 3

Means for MAP Communication Arts Standard Scores

Preschool	Not Attending Preschool	Attending
Mean	622.83	639.76
N	112	127
Std. Deviation	40.788	45.150
Median	623.00	643.00
Std. Error of Mean	3.0854	4.006
Variance	1663.680	2083.503

Table 4 depicts the mean for MAP Math standard score for students not attending and attending preschool. The mean standard score for students not attending preschool is 603.63 with a standard deviation of 34.138 and a median of 600.50. The standard error of mean is 3.226 and a variance of 1165.387. The mean MAP math standard score for students attending preschool is 620.87 with a standard deviation of 47.899 and a median of 625. The standard error of mean is 4.250 and a variance of 2294.286.

Table 4

Means for MAP Math Standard Scores

	Not Attending Preschool	Attending Preschool
Mean	603.63	620.87
N	112	127
Std. Deviation	34.600	47.899
Median	600.50	625.00
Std. Error of Mean	3.226	4.250
Variance	1165.387	2294.285

A comparative analysis of the means for preschool attendance and MAP Communication Arts standard scores was conducted using a T-test. The mean MAP Communication Arts standard score for students who attended preschool was 639.76 compared to 622.82 for those who did not attend preschool (see Table 5). The numerical difference in the scores is 16.94. The results of the Independent Samples T-test revealed the degrees of freedom to be 237. Equal variances assumed, the test indicated a two-tailed significance level of .003. There was a significant difference of .003 in the mean MAP Communication Arts standard scores of students who attended preschool and those who did not.

Table 5

Analysis of Means for Communication Arts Standard Scores

Group	Means	Independent Samples T-Test			
		t	*df*	Sig. (2-tailed)	Mean Difference
Students Attending Preschool	639.76	-3.027	237	.003	-16.934
Students Not Attending Preschool	622.83				

* Significant at the p>.05 level

The mean MAP Math standard score for students who attended preschool was 620.87. compared to 603.63 for students who did not attend preschool. The numerical difference in the scores is 17.24. The results of the T-test indicated the degrees of freedom to be 237. Equal variances assumed, the test indicated a two-tailed significance level of .002. A significance level of .002 indicates a significant difference in the means of MAP Math standard scores for students who attended preschool and those who did not. These results are depicted in Table 6.

Table 6

Analysis of Means for MAP Math Standard Scores

Group	Means	Independent Samples T-Test			
		t	df	Sig. (2-tailed)	Mean Difference
Students Attending Preschool	620.87	-3.165	237	.002	-17.240
Students Not Attending Preschool	603.63				

* Significant at the p>.05 level

Summary, Conclusions, and Recommendations

Based on the review of the literature and the analysis of data the following conclusions and recommendations appear warranted. Numerous studies have been conducted to investigate the impact of preschool programs. Studies conducted by Head Start, Even Start, Follow Through, Learning to Learn, and others have shown that two or more years of preschool can improve a child's readiness for school and provide cognitive and social enrichment that promote a child's ability to be successful (Lunenburg, 2000). This study was conducted to investigate the impact of preschool attendance in publicly funded Missouri Title I preschools on the achievement of third grade students on the Missouri Assessment Program Test (MAP).

This study targeted a specific group of students. The student population in this study was selected from Title I school districts in the Missouri Bootheel. The Missouri Bootheel region was selected because it is an area of high poverty. Many families in the Bootheel region live with little or no income other than state funds. There are no large cities in the Bootheel with most of the area being agricultural. The median per-capita income in the Missouri Bootheel region is $24,538 with 25.6% of the population living in poverty (Southeast Missouri State University, Center for Regional History, 2007). The free-reduced lunch percentages range from 60% to 100% for districts in the Missouri Bootheel (Missouri Department of Elementary and Secondary Education, 2007).

Summary of Data Analysis

The study compared the MAP mean standard scores of students who attended preschool and those who did not. The student scores were collected from MAP data from five school districts in the Missouri Bootheel area with a total of 239 MAP standard scores. A comparison of the means of the standard scores of students who attended preschool and those students who did not attend preschool revealed significant differences in the scores between the two groups for both math and communication arts. The numerical difference in the means of the MAP communication arts standard scores for students attending preschool and those not attending preschool was 16.94. The difference in the means of the MAP math standard scores for students attending preschool and those not attending preschool was 17.24. The difference revealed that students with preschool experience had higher average scores than those with no preschool experience. A comparative analysis of the performance levels revealed that most scores (131 students in communication arts, and 130 in math) fell in performance level 2 which is basic level. MAP communication arts data also revealed that 31 students scored at level 1 (below basic) and 32 students scored at level 4 (advanced). Data from MAP math scores revealed similar results. Data revealed 27 students scored in level 1 (below basic) and 14 scored in level 4 (advanced). The scores did tend to follow a typical bell curve form in that most of the scores were in levels two and three with smaller numbers in level one and level four.

Conclusions

The Missouri publicly-funded preschool program, which meets seven of the ten quality standards set by the National Institute for Early Education Research (2008), is a viable strategy for improving student achievement. The analysis of data in this study indicates that preschool attendance in Missouri Bootheel schools has a significant impact on Missouri Assessment Program scores. School districts in the Missouri Bootheel report improved student performance in MAT testing as a result of preschool attendance; the percentage of students scoring in levels one and two was higher among students who attended preschool than among those who did not attend preschool.

Recommendations

The following recommendations include:

1. Since research has shown that preschool not only impacts student performance but also impacts student progress in kindergarten after one or two years of preschool, studies should be conducted to further analyze progress of students in kindergarten.

2. Another recommendation for further research is to determine if one component is more effective than others or if components used in combination are more effective than when applied alone. For example, there are three types of curriculum currently available to school districts in Missouri. Those three are High Scope, Project Construct, and Creative Curriculum (Missouri Department of Elementary and Secondary Education, 2007). Numerous studies have been conducted on preschools

utilizing High Scope because it has been available for a longer period of time. However, Project Construct and Creative Curriculum are relatively new; less data is available to show improvement in student performance. Further research might prove one of these components to be more effective in improving student performance than the other components.

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