ABSTRACT

PRESCHOOL IMPACT ON EMERGENT LITERACY IN KINDERGARTEN STUDENTS: A CASE STUDY

by Shawna Leanne Whitehead

The current study explored the role of preschool attendance in early literacy attainment (as measured by scores on the STAR Early Literacy assessment) for students in kindergarten. It also examined the difference between students of low-income backgrounds who did, and did not, attend preschool. This research was conducted in order to answer a specific question that school administrators from a local school district had: Does preschool make a significant difference in students’ early literacy attainment? Results indicated that students who attended preschool scored significantly higher than students who did not attend preschool. In addition, results from the present study demonstrated that students of low SES who went to preschool did not score significantly higher than students of low SES who did not go to preschool. This only occurred during the winter, though, as students of low SES who went to preschool did score significantly higher on their spring SEL scores than students of low SES who did not go to preschool. Based on the findings of this study, a relationship between preschool attendance and early literacy development was confirmed.
PRESCHOOL IMPACT ON EMERGENT LITERACY IN KINDERGARTEN STUDENTS: A CASE STUDY

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Shawna Leanne Whitehead

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Advisor: Raymond Witte
Reader: Michael Woodin
Reader: Jason Abbitt
Reader: Joel Malin

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by

Shawna Leanne Whitehead

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The School of Education, Health, and Society

and

Department of Educational Psychology

____________________________________________________
Raymond Witte

____________________________________________________
Michael Woodin

____________________________________________________
Jason Abbitt

____________________________________________________
Joel Malin
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Dedication

For Mary, Andy, Nathan, and Angela. All of you are my continuous inspiration. Thank you for your unconditional love and support.
Acknowledgements

This thesis would not have been possible without the support and oversight from my tremendous committee. I want to acknowledge their support and guidance throughout this learning process.

I also must acknowledge the love, support, and encouragement from my family and friends. There is never a day where your love goes unnoticed and I appreciate the immense impact your support has had on my entire life. My gratitude is endless.
Introduction

Students' difficulty with attaining literacy skills in school is well documented (Chatterji, 2006; Howes, Burchinal, Pianta, Bryant, Early, Clifford & Barbarin, 2008; Franco, 2013; National Center for Education Statistics, 2015). In the United States, approximately 32% of fourth grade students score below the 'basic' level on their reading assessments, and greater than half of that same population is not reading at grade level (National Center for Education Statistics, 2015). Meanwhile, approximately 25% of eighth grade students fall below the 'basic' level on their reading assessments (Reese & Suggate, 2012; National Center for Education Statistics, 2015). These large numbers of struggling students force educators and researchers alike to question what underlies this phenomenon. In terms of demographic-specific data, students that are of low SES and/or of minority groups are more likely to be behind their peers in early literacy skills upon kindergarten entry; this unfortunate gap shows a pattern of increasing over time as well (Callaghan & Madelaine, 2012). Moreover, strong evidence suggests that kindergarten literacy skills significantly predict first-grade reading outcomes, even when factors such as poverty are controlled for (Callaghan et al., 2012).

Administrators at a rural elementary school in Ohio reported concerns in regard to emergent literacy skills for their kindergarten students. In this school, nearly 50% of the kindergarten class did not attend preschool, and approximately one-third of the students met the definition of low socioeconomic status (as defined by free- or reduced-price lunch). In knowing about the aforementioned issues of literacy achievement within grade levels and over time, these concerns prompted this research initiative to explore how preschool might correlate to emergent literacy achievement in this population. The current study also focused on the differences between students of low-income who do, and do not, attend preschool.

Literature Review

Emergent literacy can be defined as the knowledge, skills, and attitudes that represent developmental precursors to conventional reading and writing (Lonigan, Burgess & Anthony, 2000). Although children learn about reading and writing early on, they are speakers and listeners long before they acquire these skills. English Language Arts (ELA) in preschool consists of both oral and written language. Oral language, or orality, represents the speaking and listening side of ELA, while written language, or literacy, represents both reading and writing (Morrow, Gambrell & Roskos, 2015). These two concepts have a clear, reciprocal relationship; orality continually informs literacy, while literacy influences orality (Morrow et al., 2015). There is empirical evidence to suggest that measures of oral language are moderate predictors of literacy outcomes (Griffin, Hemphill, Camp & Wolf, 2004; Reese et al., 2012; Marchman, Adams, Loi, Fernald & Feldman, 2016). One tool that is used within the ELA curriculum to build oral language skills is shared book reading. Moreover, dialogic reading (i.e., a subtype of shared book reading) which includes direct questions, feedback, and expansive student responses has been found to have a moderate impact on oral language development (Callaghan et al., 2012).

Prior research at the preschool level has also found Phonological Awareness (PA) to be a determinant of early reading achievement (Callaghan et al., 2012; Lonigan et al., 2000). In the broadest of terms, PA is a metalinguistic ability; specifically, the ability to orally manipulate large units of sound in rhyming tasks, count syllables, segment and blend onset (the initial consonant of a word) and rime (vowel and consonants that follow the onset)
down to the singular phoneme (i.e., the smallest discrete unit of a sound). Not only does PA impact how “school ready” a child is, it also is considered predictive of first grade literacy outcomes including reading comprehension, spelling abilities, and decoding skills (Callaghan et al., 2012). Given its importance, many standardized batteries include and measure this skill. For example, Phonological Awareness represents one of seven sub-tests that make up the overall scaled score of the STAR Early Literacy assessment (i.e., the assessment instrument that was used in this research study). Overall, emergent literacy is crucial to the foundation of later literacy outcomes and serves as a basis for other academic areas. Preschool instruction likely involves these early literacy skills as the preschool model has shifted to reflect increased academic expectations (Brown, 2013; Hatcher, Nuner & Paulsel, 2012).

**Preschool Paradigm Shift**

In the past, preschool solely used play-based methods to build social skills prior to kindergarten. Now, preschools tend to use a more academic model for kindergarten preparation (Brown, 2013). Hatcher and colleagues (2012) found that this shift in preschool models can be associated with the increase of academic demands in kindergarten; the learning expectations have changed. Findings also indicated that teachers and parents expressed a need for preschools to encourage acquisition of literacy skills. More generally speaking, parents and teachers both seemed to view kindergarten as a place of high expectation and task-oriented projects with less of a social focus. It was expected that preschool would prepare students for academic work including reading, writing, and computation (Hatcher et al., 2012).

It is possible that the shift in perspective could be related to recent Ohio education mandates and standards. Education legislation, such as the Third Grade Reading Guarantee has put considerable pressure on both teachers and students to perform at a certain level before entering the fourth grade (Franco, 2014; Simon, 2015). This legislation was passed in an attempt to replicate a reading model originally implemented in Florida. If students are found to not reach the minimum standards on their third grade reading assessments, they are retained. Furthermore, within the same year (i.e., 2010) of the new mandate, Ohio adopted the Common Core Standards; a new set of state standards for Ohio education. The dual-implementation alone created a heavy burden on school districts. In addition, research has indicated negative outcomes, such as increased likelihood of school dropout and psychosocial maladjustment, in association with student retention as mandated by the Third Grade Guarantee (Simon, 2015; Jimerson, 2001).

However, research has shown that attending preschool may increase the likelihood that students will meet these legislation-related goals, and also that not attending preschool can contribute to difficulties, in literacy for example, to persist over time. Skibbe and colleagues (2013) found that children who had preschool, followed by kindergarten, had higher PA scores, early reading scores, and mathematic scores than children without the preschool experience the previous year. Yoshikawa and colleagues (2016) reported that one year of preschool equated, on average, with three additional months of learning beyond what a typical child would experience without access to preschool. They also found small reductions in retention and positive high school graduation outcomes. Despite these findings and legislative changes, the debate on whether preschool should be academic or developmental in design still continues. Some debate has also surrounded the potential
difference between entities that provide preschool such as Headstart, public, and private institutions (Coley, Votruba-Drzal, Collins & Cook, 2016; Kline & Walters, 2016).

**Differences Across Type of Preschool.** Does the type of preschool program that a child attends make a difference in their level of readiness for kindergarten? Do their achievement scores differ? Taylor and colleagues (2000) investigated a possible difference in achievement for students who attended a public, private, or Head Start preschool program. Their findings suggest that students, in general, who attend preschool exhibit a higher level of ‘readiness’ than do students who do not attend preschool. Moreover, there was no significant difference found between the types of preschool that students attended. This finding highlights the importance of preschool attendance and curriculum design over the physical entity that provides the instruction.

**Preschool Impact on Early Literacy Development**

Prior research has found that preschool can have a significant impact on early literacy development (Howes et al., 2008; Huang, Invernizzi & Drake, 2012; Lonigan et al., 2000; Magnuson, Ruhm & Waldfogel, 2007; Morrow et al., 2015; Prior, Bavin & Ong, 2011; Skibbe et al., 2013; Taylor, Gibbs & Slate, 2000; Welsh, Nix, Blair, Bierman & Nelson, 2010; Zubrick, Taylor & Christensen, 2015). Literacy development initiates long before the start of primary school and there is risk associated with low school readiness at age four for impaired literacy achievement at age ten (Zubrick et al., 2015). Additionally, developmental research has found that preschool can have a positive impact on children’s approach to learning; children undergo rapid development in both working memory and attention, which both correspond with academic achievement (Welsh et al., 2010).

A recent study explored the possible predictors of school readiness (i.e., oral language, pre-literacy skills, social and behavioral characteristics, maternal well-being, parental literacy) in over a thousand five- to six-year old students, and found pre-literacy skills to be one of the strongest predictors for later reading success (Prior, Bavin & Ong, 2011). Furthermore, it is possible to identify students who are ‘at-risk’ of problematic reading as early as preschool-age (Taylor, Gibbs & Slate, 2000). Taylor, Gibbs, and Slate (2000) investigated the relationship between preschool attendance and kindergarten readiness. Results indicated that students who attend preschool are more likely to exhibit higher achievement scores overall, and higher scores on a kindergarten-readiness assessment than students who did not attend preschool; this finding has been found across other studies as well (Magnuson, Ruhm & Waldfogel, 2007; Skibbe et al., 2013). It was also noted that high-risk children who attended preschool exhibited more readiness than high-risk children who did not attend preschool. The preschool experience appears to be an important tool for developing a base to master these concepts and embark on a path toward meeting kindergarten-entry standards (Huang, Invernizzi & Drake, 2012; Lonigan et al., 2000; Morrow et al., 2015). Furthermore, neuropsychological research has provided additional evidence to support the importance of preschool.

**Neuropsychological Foundation.** Research has explored why, neurologically, preschool may provide an essential foundation for literacy. A sensitive period is when the effect of some experience on the brain is especially strong during a limited window in time. Any learning that occurs during a sensitive period can create a solid base for future learning (Krudsden, 2004). For example, Popli and colleagues (2013) found that reading
scores at age 14 are sensitive to literacy investments made between ages three to five. Moreover, reading to children at the age of three is strongly associated with reading ability at age seven (Popli, Gladwell & Tsuchiya, 2013). These findings imply that learning opportunities should be available during early periods of life (i.e., preschool age) for children to maximize their literacy abilities. Prior research encourages children to be in early social settings with ample exposure to complex language and books, along with the encouragement to express themselves (Kuhl, 2011). Research has also been done to explore the potential impact of preschool on students of varying sociodemographic factors.

**Sociodemographic Factors.** Across different racial groups and SES, children exhibit different patterns of literacy achievement by the first grade. Chatterji (2006) found that reading achievement gaps were evident in three groups: African Americans, boys, and high-poverty students. When students of low SES begin kindergarten, they are already behind their peers in early numeracy, social skills, and emergent literacy skills (Lee & Burkham, 2002; Halle, Forry, Hair, Perper, Wander, Wessel & Vick, 2009; Lamy, 2013). By the first grade, students’ reading difficulty is associated with lack of prior reading preparation, with the high-poverty students receiving the least amount of prior experience (Chatterji, 2006). Students of low SES often lack early educational support at home (e.g., less conversational banter, educational toys, books); their parents usually have less psychological and financial resources (Lee & Burkham, 2002; Halle et al., 2009; Lamy, 2013). Developmentally, these students could benefit from the cognitive stimulation and enriching environments that preschool provides. Effort in the pre-primary years to improve students’ emergent literacy could potentially improve their performance in later years as well (Chatterji, 2006; Lamy, 2013).

Additional research has been done to further explore the impact of race, SES, and general familial background. Beyond the understanding that these factors play a significant role in a child’s academic life, some findings have supported that children’s skills obtained in preschool are able to predict first-grade achievement and beyond, even when controlling for sociodemographic factors (Skibbe et al., 2013). Although, research has shown one of the most robust patterns within education: the positive correlation between SES and student achievement (Alexander, Entwisle & Oldson, 2001; Buckingham, Beaman & Wheldall, 2014; Hair, Hanson, Wolfe & Pollak, 2015; Reardon, 2011). Children of low SES are more likely to have poorer grades and outcomes on standardized tests that later contribute to low wages and income (Hair et al., 2015). Larson (2015) and colleagues conducted a study where students were given a composite SES score according to their parent’s education, income and occupation. Then, they placed the students into quintiles based on their composite score. They found that students in the lower SES quintiles were more likely to have less frequent parent reading, fewer books at home and less home computer use. The researchers also found that parent’s supportive interactions, children’s preschool attendance, and parent’s expectancy for their child to earn a college degree increased across quintiles; meaning, the percentage of parents with the aforementioned interaction and expectations increased alongside SES (Larson, Russ, Nelson, Olson & Halfon, 2015).
Rationale and Purpose of the Study

Administrators at a rural elementary school in Ohio reported that 58% of their kindergarten students did not reach the benchmark score, approximately the 55th percentile (Renaissance Learning, 2016), on their early literacy assessments. Early literacy and reading skills are predictive of later learning (Duncan, Claessens, Magnuson, Huston, Klebanov & Sexton, 2007) and therefore this issue was concerning to administrators at a rural elementary school in Ohio. The researcher was approached by the district to answer questions regarding preschool and early literacy foundations in regard to this group of students.

Research Questions. Two main research questions are explored in this study: 1) Is there a significant difference, as in greater test performance, between kindergarten students who attended preschool compared to students who did not attend preschool in regard to literacy (as defined by scores on the STAR assessment)?; 2) Do students of low socioeconomic status who have attended preschool perform higher on literacy-focused tests as compared to students of low socioeconomic status (SES) who have not?

Research Methodology

Participants

The participants of this study included 64 kindergarten students from a rural elementary school in Southwest Ohio; the sample included the entire kindergarten class. To qualify for the study, a student must have completed the Star Early Literacy (SEL) assessment during either the fall and/or spring testing periods during the school year. The elementary school uses the SEL assessment as a benchmarking tool twice a year in kindergarten. Overall, the majority (i.e., greater than 95%) of the students were White and Non-Hispanic. The elementary school had a unique SES make-up; specifically, 32% of the school population is from an economically disadvantaged background (ODE, 2016). Moreover, approximately one-third of the kindergarten sample qualified for free- or reduced-price lunch (i.e., low SES).

Protection of Human Subjects

The dataset that was used included was previously collected data from the school. The research process involved no harm to students. Furthermore, the researcher had no direct contact with any student. The dataset that was used de-identified all students and the dataset remained confidential. Following the de-identification process, the researchers used random number assignment for each case to further protect the students. After the data analysis was completed, the results were returned to the school in that form to ensure confidentiality.

Measurement

The STAR Early Literacy (SEL) is a computer-adaptive test (CAT) for measuring kindergarten reading skills. CATs are designed to adapt depending on how a child is performing on the test items (i.e., if the child is performing well they are presented with more difficult questions, if they are performing poorly they are presented with easier questions). The SEL assessment is a benchmarking measure, with progress monitoring potential, created by Renaissance Learning to determine students’ early literacy skills. The
test uses adaptive branching, meaning that it generates questions based on how the child is performing. There are a total of 27 test items and three major domains: Word Knowledge and Skills, Comprehension Strategies and Constructing Meaning, and Numbers and Operations. Administration of the SEL takes approximately 5-20 minutes to complete, with the majority of students typically completing it within 10 minutes (Renaissance Learning, 2016).

The literacy assessment is intended for preschool to third grade students. At the kindergarten level, there are no test items from the Comprehension Strategies and Constructing Meaning Domain. Instead, there are 22 items from the Word Knowledge and Skills Domain and 5 items from the Numbers and Operations Domain. For the purpose of this study the researcher focused on the full 27 items, which make up an early literacy composite score. The seven sub-subtests encompassing the major domains (i.e., Word Knowledge and Skills, Numbers and Operations) are: Alphabetic Principle, Concept of Word, Visual Discrimination, Phonemic Awareness, Phonics, Vocabulary, and Numeracy (Renaissance Learning, 2016).

Upon completion of the SEL assessment, the 27 items produce an overall, single-valued scaled score to summarize students’ performances. The overall scale is non-linear and a representation of a student’s Rasch ability estimate as a result of the SEL assessment. The scaled score can range from 300-900 and is considered a best estimate of a student’s overall reading ability at a given time. This score is also somewhat indicative of the age of students with similar ability. For example, a scaled score of 400 may be indicative of a 4-year-old student; however, this is a rough estimation (Renaissance Learning, 2016). Depending on a student’s score, they are then categorized by three literacy classifications: Emergent Reader (a score of 675 and below), Transitional Reader (a score of 675 to 774), and Probable Reader (a score of 775 and above).

Overall, the SEL assessment is considered to be both reliable and valid; it has been found to be a statistically significant predictor of year-end reading and other literacy skills (Renaissance Learning, 2016). This assessment is often marketed as being cost-effective, valid, and reliable; more so than other curriculum-based measures that cost much more in terms of time, staff, and consumable expenditures. Research on the SEL has suggested that it may be too early to conclude that it can completely replace paper assessments, but that it is a strong measure of early literacy overall (Clemens, Hagan-Burke, Luo, Cerda, Blakely, Frosh & Jones, 2015). According to the United States Department of Education’s research, the SEL has been deemed an appropriate progress-monitoring assessment (U.S. Department of Education, 2015), and The National Center of Intensive Intervention (2015) has convincing evidence across many reliability and validity data measures on the SEL.

**Star Early Literacy Reliability.** Three reliability indexes are provided from Renaissance Learning: generic reliability, split-half reliability, and retest reliability. Generic reliability is the proportion of test score variance that is attributable to actual variation of the test traits, and is able to provide estimates of measurement precision for the SEL. The split-half reliability index is a computation of internal consistency. Traditional measures of internal consistency (e.g., Cronbach’s alpha, Kuder-Richardson Formula 20) are not calculated for adaptive tests, so a split-half approximation of internal consistency was used. This measures how the first half of the assessment correlates with the second half of the assessment, followed by that correlational score being adjusted by the Spearman-Brown
formula in order to estimate the reliability of the entire assessment. The test-retest, or retest, reliability index obtains a score by determining the correlation between two sets of test scores. This measure is the most definitive reliability measure due to the adaptive nature of the assessment (Renaissance Learning, 2016). The aforementioned reliability index scores (scaled scores) were reported from Renaissance Learning (2016) as follows for the kindergarten level: generic reliability (.77), split-half reliability (.75), and retest reliability (.66).

**Star Early Literacy Validity.** Two main validity indexes are provided in the Renaissance Learning Technical Manual: concurrent validity and predictive validity. The concurrent validity is found via correlations between two test scores (i.e., SEL and other related instruments) from administrations that were close in time. Predictive validity measures the ability of the SEL scores to predict measures or performance given at a later time (i.e., more than two months between administrations). The concurrent and predictive validity measures at the kindergarten level were .64 and .57, respectively (Renaissance Learning, 2016). Clemens and colleagues (2015) found the SEL assessment to have a similar, moderate predictive validity (.39-.58) across its’ subtests. Renaissance Learning (2016) also reported strong content validity based on the alignment of SEL’s test items to major literacy domains (e.g., phonemic awareness, vocabulary, alphabetic principle).

**Procedures**

Initially, concerns regarding the current kindergarten class were expressed from the principal and kindergarten teachers of the elementary school. The principal received approval for research in conjunction with Miami University from the school district’s Director of Curriculum, and official approval for school-level data access was given to the researcher via a letter from the district and the principal. Next, Institutional Review Board (IRB) approval was obtained from Miami University. The study’s application to the IRB was submitted as exempt as it involves existing data and has minimal risk associated with the review process. Following approval from the IRB, the de-identified data were provided to the researcher and were further randomized by random number assignment to each case. After the data were completely de-identified, randomized, and organized, it was analyzed via the Statistical Package for the Social Sciences (SPSS) to address the research questions.

**Data Analysis**

The main focus of this research was to understand the impact of preschool in relation to emergent literacy for a group of kindergarten children. The data was analyzed using SPSS. To explore the difference between students who have, and have not, attended preschool in terms of emergent literacy skills on the SEL, the researcher first had to analyze whether or not the data were normally distributed. Normality was analyzed using the Shapiro-Wilk test. Once the status of normality was determined for the data set of the first question, a Pearson’s Test of Correlation was used. The low SES data was also found to be normally distributed. However, to analyze the difference between students of low SES backgrounds who have, and have not, attended preschool, a Mann Whitney U test was used due to a small sample size. A Mann Whitney U allows a researcher to compare two independent samples, and ensures the results do not report a Type II error through
computation of a sum-of-ranks value for each sample, and inputting the numerical values to a formula (Huck, 2012).

Results
The most fundamental aspect for both research questions is whether or not a child attended or did not attend preschool. In a few cases this was not indicated in the data set and as a result, all unknown cases (N=3) were removed from the analysis. There were SEL scaled scores for a total of 64 kindergarten students for both the winter (SS Winter-Yes, No) and spring (SS Spring-Yes, No). The ‘Yes’ or ‘No’ next to a scaled score set indicates whether the scores are for the group who went to preschool or the group who did not go to preschool.

Star Early Literacy Comparison: Preschool or No Preschool
The first question the researcher explored was: Is there a difference in achievement (as defined by SEL) between students who attended preschool and those who did not? The null hypothesis was as follows: There is no significant difference between kindergarten students who attended preschool and those who have not attended preschool in regard to their STAR Early Literacy achievement. The 64 SEL scores were divided into two groups based on those who went to preschool (N=35) and students who did not attend preschool (N=29). See Table 1 for descriptive statistics of both the winter and spring SEL scaled scores.

<table>
<thead>
<tr>
<th></th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Preschool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>M (SD)</td>
<td>576.07 (96.86)</td>
<td>655.38 (102.34)</td>
</tr>
<tr>
<td>Min</td>
<td>391</td>
<td>459</td>
</tr>
<tr>
<td>Max</td>
<td>792</td>
<td>836</td>
</tr>
<tr>
<td>Preschool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>M (SD)</td>
<td>652.77 (101.33)</td>
<td>728.09 (95.07)</td>
</tr>
<tr>
<td>Min</td>
<td>487</td>
<td>547</td>
</tr>
<tr>
<td>Max</td>
<td>857</td>
<td>877</td>
</tr>
</tbody>
</table>

It was determined that normality could be assumed, and the researcher began an Independent Samples T-test analysis. Levene’s test indicated that equal variances could be assumed, p > .05. Results of the t-test demonstrated that for the winter SEL scores, there was a significant difference between kindergarten students who attended preschool and students who did not attend preschool, t(65)=2.857, p < .05. In the winter, students who attended preschool the previous academic year scored higher on the SEL assessment (M=652.77, SD=101.33) than students who did not attend preschool (M=576.07, SD=96.86). For illustration of the results for winter, see Figure 1.
A similar result was found for the spring, indicating a significant difference between students’ spring scores on the SEL assessment, \( t(62)=2.942, p<.05 \). The students who had attended preschool (\( M=728.09, SD=95.07 \)) scored higher than students who did not (\( M=655.38, SD=102.34 \)); therefore, there was a significant difference in early literacy achievement between students who attended preschool and students who did not attend preschool. To see illustration of the results for spring, see Figure 2.
Exploring Differences Between Students of Low Socioeconomic Status

In the next analysis, the same question was examined, but specific to students of low SES: Do students of low SES who have attended preschool perform better on SEL compared to students of low SES who have not? The null hypothesis was as follows: There is no significant difference between kindergarten students of low socioeconomic status who have attended preschool and kindergarten students of low socioeconomic status who have not attended preschool in regard to their STAR Early Literacy achievement. See Table 2 for descriptive statistics of both the winter and spring SEL scaled scores for students of low SES.

Table 2. Descriptive Statistics of Winter and Spring SEL Scaled Scores (Low SES)

<table>
<thead>
<tr>
<th></th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Preschool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>M (SD)</td>
<td>546.23 (108.73)</td>
<td>610.85 (99.19)</td>
</tr>
<tr>
<td>Min</td>
<td>391</td>
<td>459</td>
</tr>
<tr>
<td>Max</td>
<td>726</td>
<td>775</td>
</tr>
<tr>
<td>Preschool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>M (SD)</td>
<td>635.89 (88.55)</td>
<td>729.11 (87.13)</td>
</tr>
<tr>
<td>Min</td>
<td>537</td>
<td>598</td>
</tr>
<tr>
<td>Max</td>
<td>795</td>
<td>856</td>
</tr>
</tbody>
</table>

The Shapiro-Wilk test indicated that normality could be assumed for both the winter and spring scores, p > .05. However, due to small sample size (N = 22) a nonparametric test was used. Results of the Mann Whitney U analysis indicated that, in the winter, there were no significant differences found, U=37, p > .05. For illustration of the results, see Figure 3.
Figure 3. The winter STAR Early Literacy scores for low socioeconomic students who attended preschool versus students who did not attend preschool.

For the spring scores, there was a significant difference found between students of low socioeconomic status who attended preschool and those who did not, U=21, p < .05. Students of low socioeconomic status who attended preschool scored higher ($M=729.11$, $SD=87.13$) than students of low socioeconomic status who did not attend preschool ($M=610.85$, $SD=99.19$). For illustration of the results, see below Figure 4.

Figure 4. The spring STAR Early Literacy scores for low socioeconomic students who attended preschool versus students who did not attend preschool.

**Discussion**

Results indicated that there was a significant difference in SEL scores for students who went to preschool and students who did not go to preschool. However, one differing finding was that students of low SES who went to preschool did not score significantly
higher than students of low SES who did not go to preschool. This phenomenon only occurred during the winter, though, as students of low SES who went to preschool did score significantly higher on their spring SEL scores than students of low SES who did not go to preschool.

Implications of Findings

This research was conducted in order to answer a specific question that administrators had in a particular school in a local school district: Does preschool make a significant difference in students’ early literacy attainment? The results have provided an affirmative answer to that question. The findings from this research supports the importance of preschool experience, and the link between preschool and emergent literacy.

For the overall sample, students who attended preschool scored significantly higher on their SEL assessments than students who did not attend preschool in the winter (see Figure 1) and in the spring (see Figure 2). For this sample of low socioeconomic (i.e., identified as free- or reduced-price lunch recipients) students’ scores, the students who attended preschool scored higher overall in the winter than students who did not attend preschool. However, those winter scores did not result in a significant difference (See Figure 3). Interestingly, in the spring, students of low SES who attended preschool did score significantly higher on their SEL assessment than students of low SES who did not attend preschool (see Figure 4).

Although the scores were higher overall for students of low SES who attended preschool, in the winter, they were not significantly higher until the spring SEL assessment. Research indicates that preschool can help to develop a foundation to master early literacy concepts and embark on a path toward meeting kindergarten standards (Morrow et al., 2015; Huang, Invernizzi & Drake, 2012; Lonigan et al., 2000). The research suggests that the achievement differences between students who attend preschool and students who do not may not be apparent immediately, or even by their first benchmark assessment. It is more accurate to infer that, over time, preschool impact becomes apparent. Another explanation could be that preschool is able to provide low SES students with early exposure to early literacy skills that would be further explored in kindergarten; they have a foundation to build on. The low SES students who did not attend preschool lacked this early exposure, and therefore did not build the same amount of foundational literacy skills, as those low SES students who attended preschool. The foundation built throughout preschool may have led to significantly higher scores in the spring when the kindergarten students were exposed to newer, more complex material as compared to the material in the winter. When the low SES students who did not attend preschool learned the same material in the spring, they may have lacked the early exposure and foundational skills and consequently fell further behind their low SES peers who did attend preschool.

Limitations and Future Research

This research has at least two significant limitations: sample size and generalizability. The size of the overall sample included only 64 students’ SEL scores. For the sample of students identified as low SES, the sample size was even smaller (n=26). Despite this small sample size, the current findings still allow for a better understanding of the relationship between preschool attendance and emergent literacy outcomes in kindergarten for the participating school within this research study. Also, the
generalizability of the results must be recognized. The sample size is small and the data is from a kindergarten class at one particular school; the results cannot be generalized. With these acknowledged limitations, it is important to recognize that this research was done to answer a school’s question and provide administrators with feedback for moving forward as the district considers curriculum plans.

Future research could focus on the general topic surrounding the importance of preschool. More specifically, future studies could expand this research by involving the entire district and provide more feedback for potential systems-wide change and implementation of preventative practice. This research could also be studied more in depth across the state and country with a larger, more generalizable sample so that more generalized inferences can be made.

**Contribution to School Psychology**

Although small-scale, this study makes a contribution to the field of school psychology. Between 2001 and 2014 alone, there has been a more than two-fold increase in state funds for universal preschool (Bassok & Latham, 2014); but not for Ohio. The current results provide further evidence that universal preschool could be extremely beneficial for Ohio, and have positive outcomes for literacy achievement in the future. Also, the researcher has done this research in real-time to help solve a question asked by a local elementary school. The ability to use data to answer a question that teachers, administrators or other school personnel are asking is invaluable to the practice of school psychology.

Moving forward, the teachers and administrators at the participating school can make changes with a better understanding of preschool impact on their kindergarten students and beyond. The researcher plans to provide key information, results and intervention information to these school administrators. Every public school in Ohio is required to administer a kindergarten readiness assessment to all of their kindergarten students at the beginning of each year. This assessment evaluates where students stand with their current language and literacy skills (Ohio Department of Education, 2016). This requirement should be taken advantage of as it could help to immediately flag students who will need extra support at the beginning of the kindergarten year; students who are at-risk for not reaching their benchmark scores could be supported with evidence-based early literacy interventions.

**Conclusion**

The challenge of connecting student outcomes to current practice suggests that educators need to be more proactive in terms of data application; especially when data is pre-existing and readily available. Unfortunately, literacy attainment across the nation has not reached its full potential. In Ohio, 63% of our fourth graders are reading below the ‘proficient’ level (National Center for Education Statistics, 2015). The current study directly addresses aspects of the aforementioned issues, and explores literacy achievement outcomes among a kindergarten class with the majority of students not reaching benchmark on the STAR Early Literacy assessment. This study aimed to determine whether or not preschool could be one of the underlying factors linked to this phenomenon.

In this study, the researcher found that preschool attendance made a positive impact on early literacy achievement which is in agreement with existing literature.
(Magnuson et al., 2007; Prior et al., 2011; Skibbe et al., 2013). The current study found preschool to have this same impact with students of low SES. In the low SES population, it is known that pre-primary preparation is a significant indicator of reading success in later years (Chatterji, 2006); especially when this population is less likely to receive supports for, and exposure to, emergent literary practice outside of the classroom (Larson et al., 2015). Overall, the results of this study have further affirmed the importance of preschool’s role in emergent literacy, and how students may benefit from universal access to preschool.
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