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The Relationship Between Parental Involvement and Reading Achievement for Middle School-Aged Children with Autism

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Abstract

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by

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MA, University of Missouri, 2003

BS, Hastings College, 2000

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The problem that is addressed in this study is that the relationship between parental involvement (PI) and reading levels among middle school students with autism spectrum disorder (ASD) is not sufficiently known. Studies have shown the importance of providing reading material to elementary-level children for home use; however, there is little research on middle school students. The purpose of this study was to discover if a relationship exists between PI and improved reading scores of middle school students with ASD. The study included parents of 27 middle school students with autism. Thorndike's stimulus-response theory on the transfer of learning provided the theoretical framework used to assess students with ASD and their reading responses to parental stimuli triggers. The research question addressed in this study focused on the extent to which the time parents read to their child and the number of books available at home predict the reading scores for middle school children with ASD. A quantitative, nonexperimental, correlational design was employed. The data were collected using survey of parents and from the Standardized Test for the Assessment of Reading scores. The results of a multiple linear regression revealed no statistically significant relationships between PI and improved reading scores of middle school students with ASD. Future research is recommended to provide insight into whether PI indicates improved reading achievement scores for students with ASD because this information could be used to better support academic achievement for middle school students with autism. The findings of this study have implications for positive social change in drawing attention to an academically vulnerable population and proposing direction for future studies of this population.

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Dedication

This dissertation is dedicated to my children, Jenna and Kimberly, and my husband, Frank. With their faith in my ability to complete this long journey, I finished my degree. I would also like to give credit to my faith in the Lord, who gave me the courage to continue even when I wanted to give up.

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Chapter 1: Introduction to the Study

Autism spectrum disorder (ASD) is a range of complex neurodevelopment disorders characterized by communication difficulties and restricted, repetitive, and stereotyped behavioral patterns (National Institutes of Health, 2019). One out of 68 children in the United States has received a diagnosis of ASD (National Institute of Neurological Disorders and Stroke [NINDS], 2015). The National Reading Report Card (National Center for Educational Statistics [NCES], 2015) showed that the reading comprehension passage rate of special needs students, including students with ASD, decreased between 5% to 7% between 2009 and 2015. Students with ASD often have difficulty understanding written text, leading to lower reading comprehension (McIntyre et., 2017; Ricketts et al., 2013).

A relationship exists between active parental involvement (PI)-- herein defined and operationalized as two variables, the number of books available at home and the time parents spend reading to their children— and improved elementary-level reading achievement scores, even for students with ASD (Magouirk, 2015). Parents who read with their children profoundly affect their children's subsequent language and reading capabilities (Gilkerson et at., 2017). Gilkerson et al. conducted a study to determine whether reading to young children correlated with improved familial language interaction. The researchers discovered that adult language use among young children increased during book reading. Perhaps more importantly, the rate of conversational engagement was much higher than when parents did not read with their children. Their results showed higher adult word counts and conversational turns when compared to

nonreading periods, indicating increased parent-child language engagement and interaction during reading periods (Gilkerson et al., 2017). Thus, the authors encouraged parents to read to and with their children. When parents speak or read with their children, they help their children increase their vocabulary and enjoy reading. Moreover, parents may not realize that by speaking with their children, they positively impact their children's language capabilities.

Roberts and Wilson (2006) found that students' attitudes toward reading become less positive in middle school, and there is evidence that PI in reading improves reading comprehension (Darling & Westberg, 2004; Gilkerson et al., 2017). More specifically, the focus of this study was the effect of PI on the reading achievement scores for middle schoolers with ASD. This population is of particular interest within this phenomenon because students with ASD students are at risk for academic difficulties in the area of reading (McIntyre et al., 2017). The potential implications for positive social change include that schools and parents may be able to use the results to better support reading strategies for middle school students with autism. In this chapter, I present the study background, problem statement, purpose of the study, research questions and hypotheses, theoretical framework, nature of the study, sampling plan, definition of terms, assumptions, scope of limitations, delimitations, impact on social change, and a summary.

Background

According to the NCES (2013), more than 64% of eighth-grade students do not score at the proficient level on reading tests, and middle school students' overall reading

progress has decreased. Reading scores range from basic (240) to advanced (500), and a student must score at or above 280 to be considered proficient in reading at their grade level, something only 38% of students do (NCES, 2013). Hawes and Plourde (2005) stated that a lack of PI at the middle school level might indicate low reading scores, especially for students with ASD. Studies have shown the importance of parents reading to elementary-level children (Barton et al., 2007; Roberts & Wilson, 2006); however, there is a dearth of research on reading at the middle school level. PI levels, accessibility to public libraries, and the value of books in students' homes have an impact on elementary and high school students' reading achievement levels (Duignan et al., 2002).

Educational policymakers have increasingly promoted PI in children's education (Epstein, 2010). Decades of scholarship have shown the roles of parents and the impact of PI on student performance and child development (Epstein, 2010; Jeynes, 2005). Parents and teachers are a child's first educators (Parveen et at., 2016). Parents are children's primary educators until they start school, whereas teachers significantly influence children's learning process throughout their lives; thus, both teachers and parents have crucial roles to play. Parents can get involved in many ways, from volunteering at schools (e.g., helping in the classroom or during lunch breaks) to reading to children at home, teaching songs or nursery rhymes, and assisting with homework. The two categorizations of PI are parents' involvement in their children's schools and their support of their children at home (Parveen et al., 2016).

Empirical evidence demonstrates that certain home factors, such as access to books, lead to improved educational outcomes for children. In a study that spanned 20

years, Evans (2010) found that money and education did not necessarily predict the success of children's future education. Evans noted that when parents provided books in the home, they saw an increase in the child's educational level. The results also showed how being raised in a bookless home or being raised in a house with a 500-book library had a massive impact on the level of education a child could attain (Evans, 2010). Factors such as having a 500-book library or university-educated parents propelled a child 3.2 years further in school, on average (Evans, 2010). Evans added that parents who provide even a few books at home impact education, stating as few as 20 books in the house could have a significant impact on helping a child advance to a higher level of education. The more books parents add, the better the benefits (University of Reno, 2010).

The impact of PI on reading achievement, however, has not been studied for middle school students with autism, which is a population at risk for academic difficulties in the area of reading (see McIntyre et al., 2017). The potential positive social change of this research includes that schools and parents may be able to use the results to better support reading strategies for middle school students with autism. Although extant research primarily focuses on elementary reading development, Roberts and Wilson (2006) found that reading development is also important for middle school, which is a time when students' attitudes toward reading begin to decline. While Hawes and Plourde (2005) addressed the lack of PI at the middle school level and its possible relationship to low reading scores, they did not consider the unique reading challenges or needs with ASD (Reutebach et al., 2015). The research gap addressed in this study was the impact of PI on reading achievement for middle school students with ASD; although no studies to

date have addressed this relationship for this specific population, there is a need to understand the role of PI to potentially improve reading outcomes for these students who are already at risk for academic difficulties. Advancing the understanding of the impact of PI on reading achievement for middle school students with ASD may provide evidence to improve instruction and coordination between teachers and parents for this population.

Problem Statement

The problem addressed in this study was that the relationship between PI and reading levels among middle school students with ASD is not sufficiently known. While studies have shown the value of providing reading material at home for elementary-level children (Barton et al., 2007; Hawes & Plourde, 2005; Roberts & Wilson, 2006), these studies primarily focused on the elementary school level. Extant research has shown a relationship between parents' attitudes toward reading to their elementary children and reading levels (Hawes & Plourde, 2005), but these studies have not included middle school children with ASD. There is evidence, however, that PI is important as a child ages but that it changes in nature (Boonk et al., 2018). Because students with ASD are academically high risk (St. John et al., 2018), it is important to better understand strategies that might advance their academic achievement.

When students with ASD struggle with reading, they may also struggle with other academic subjects, such as math, history, and science (McIntyre et al., 2017). PI can have a positive impact on student achievement (Hamlin & Flessa, 2018). The National Reading Panel (2015) report provided scientific evidence about effective classroom practices but did not indicate the effects of parents on their children's reading levels.

However, Darling and Westberg (2004) discovered a correlation between parents who read to students from kindergarten through third grade and improved reading performance.

St. John et al. (2018) reported that the majority of students with ASD fall behind academically. Special needs students, including those with ASD are shown to have a passage rate which decreased between 5% to 7% between the years of 2009 and 2015 (NCES, 2015). Students' attitudes toward reading is said to decline during the middle school years according to Roberts and Wilson (2006). In 2005, Hawes and Plourde stated that a lack of PI during the middle school years might indicate the lower reading scores, especially for those students with ASD. Furthermore, accessibility to public libraries, PI levels and the value of having books in the students' home impact elementary and high school students' reading levels in a positive manner (Duignan et al., 2002). There is, however, a dearth of research on the relationship between the number of hours parents spend reading with their children with ASD and the children's exposure to reading material. Therefore, in this study I focused on the lack of knowledge regarding the relationship between the PI and reading achievement levels of middle school students with ASD. Juhee (2015) stated that when parents are involved in their children's education, it makes a tremendous difference in children's literacy and reading skills. Previous research has indicated the impact of factors on school-age students and their attitudes toward reading. The specific research problem addressed in this study was the lack of scholarly understanding of PI and the reading achievement scores of middle school students with ASD (see Rashid et al., 2005; Seitz, 2010).

There is a growing discourse concerning PI in children's education. Boonk et al. (2018) conducted a review of 75 studies published between 2003 and 2017, focusing on the relationship between PI and student academic achievement; these studies primarily concluded there is a positive relationship between these two variables but were focused on neurotypical students. Studying the relationship between PI and reading levels among middle school students with ASD could provide insight into whether PI correlates with improved reading scores among middle school students with ASD. According to Epstein (2010), school policymakers are increasingly promoting PI to improve learning in the classroom. These efforts are based on evidence that a relationship exists between PI and student performance (Epstein, 2010). Similarly, evidence that this relationship exists for middle school students with ASD could be used to improve policies and programs that support this population. According to Reutebach et al. (2015), more research is needed to support reading achievement for students with autism. Scholars must research middle school students with ASD and their parents' interest in reading to them to determine whether PI results in improved reading scores for middle school children with ASD.

Purpose of the Study

The purpose of this study was to discover if a relationship exists between PI and improved reading scores of middle school students with ASD. I used a quantitative correlational research design. The independent variables were two measures of PI (i.e., the time parents spend reading to their child and the number of books available at home), and the dependent variable was a change in the reading scores of children with ASD between two test dates.

Research Questions and Hypotheses

The following research question and corresponding hypotheses guided this study:

RQ: To what extent do the time parents read to their child, and the number of books available at home, predict the reading scores for middle school children with ASD?

H_0: The time parents read to their child, and the number of books available at home, will predict the reading scores for middle school children with ASD.

H_a: The time parents read to their child, and the number of books available at home, will not predict the reading scores for middle school children with ASD.

Theoretical Foundation

The theoretical framework for this study was Thorndike's (1932) stimulus-response theory on the transfer of learning and how it applies to students with ASD and their reading responses to parental stimuli triggers. Learning theory is used to describe when the response and stimulus connect (Hall & Lindzey, 1957). Thorndike's theory of learning consists of three fundamental laws: (a) law of effect: responses to a situation (e.g., parent reading to student), followed by a reward to strengthen (e.g., reading performance); (b) law of readiness: a series of responses can connect to satisfy a goal (e.g., improved reading levels); and (c) law of exercise: connections strengthen with practice. The stimulus-response theory has been used to study learning in many related areas, such as how vocabulary and decoding are learned for bilingual students (Raudszus

et al., 2018) and the use of computer programs for teaching high school reading for teaching sight words to students with intellectual disabilities (Cazzell et al., 2019). Anindvarini et al. (2018) demonstrated the applicability of stimulus-response theory in their study of learning skills in storytelling and found that it is an effective lens for understanding the learning achievement through practice. More specifically, they highlighted that it is through repetition of the stimulus that there is greater response as the student unconsciously responds to the learning situation.

The current study is unique because there are no published studies to date on the possible relationship between the reading levels of middle school students with ASD and PI. PI is essential for students' academic success (El Nokali et al., 2010). I applied Thorndike's (1932) stimulus-response theory on the transfer of learning to assess how students respond to parental stimuli triggers. The theory of learning indicated that a relationship exists between stimulus and response, which grows stronger with use (i.e., the law of use). In this application, the parent reading to the student is the law effect that stimulates the response, the improved reading goals are the law of readiness that respond to the stimulus as the student improves reading achievement, and the increased effect is the law of exercise that connects the practice of reading with improved achievement in reading. As such, this theory supports the hypothesis guiding this study, which is that parental involvement in reading improves reading achievement; moreover, there is a dosage effect that is hypothesized, meaning that the more parental involvement present, the greater achievement I expected to observe. Specifically, when parents read to their children, they create a link to the importance of reading, which, in turn, helps children to

improve their reading comprehension levels. This theory is more thoroughly discussed in Chapter 2. In this study, the research questions were designed to assess the relationship between PI and reading achievement in which PI is a stimulus and reading achievement is the theorized response.

Nature of the Study

In this quantitative study, I used a quantitative correlational design to determine whether a relationship exists between PI, as measured by the number of books available and the time parents spend reading to their children with ASD, and the reading scores of children with ASD. A quantitative correlational design was appropriate because the purpose of this study involved observing and measuring a social phenomenon to make an observation about the relationship between quantitative variables (see Cohen et al., 2013). Parents of students attending a middle school in a midwestern U.S. state received a packet with survey information, including an invitation, the informed consent document, and a paper survey sent home with their child. After 1 week, parents who did not respond received a second survey invitation via SurveyMonkey for online self-administration of the survey. Each participating parent received an identifying number to preserve their privacy during data collection and analysis. I sent a weekly reminder notice for 3 weeks to any parents who had not completed the survey after receiving both the paper and online invitations.

I used multiple regression analysis was used to assess the relationship between PI and the reading scores of middle school students with ASD. All students took at least three STAR Reading Tests that occur at the beginning, middle, and end of the school

year. I compiled the data from the first test scores (from August and December) and compared them with the other two reading scores to see if PI had an impact on the reading scores of students with ASD. More specifically, I calculated the difference between the two scores to measure growth in reading as the dependent variable.

Definition of Terms

The following terms were used and defined as follows in this study:

Autism spectrum disorder (ASD): A range of complex neurodevelopment disorders characterized by social impairments; communication difficulties; and restricted, repetitive, and stereotyped behavioral patterns (National Institutes of Health, 2012).

Parental involvement (PI): The basic obligations of parents, including childrearing; responsibility for children's health, safety, supervision, discipline, and guidance; and governance and advocacy roles in schools (Link, 2019).

Reading achievement: Performance-based growth in standardized tests designed to measure instructional reading levels (Embree, 2009; i.e., the conceptual definition) or scores on the STAR Reading test (i.e., the operational definition).

STAR Reading test: A test administered to determine students' reading levels based on reading comprehension, vocabulary, and contextual clues (Renaissance Learning, 2020).

Stimulus-response theory: The transfer of learning and how it applies to students with ASD and their response to parental stimuli triggers (Thorndike, 1932).

Assumptions

I assumed that parents provided honest reports of how much time they spend reading with their child and of how many books they have at home. The data used within this study are from both parent reports and students' scores. Pro-social bias (i.e., the human desire for an individual to present themself as better because of social expectations) could have led parents to report survey results that bias the results of the study. Additionally, it was assumed that students were doing their best on the reading scores and that, in turn, these scores accurately reflected their reading comprehension abilities. If students do not perform well on tests or if they are not working to do their best on the test, then the tests would not accurately capture their reading comprehension.

Scope and Delimitations

The scope of this study was the relationship between PI and reading achievement for middle school students with ASD at a single middle school. As an issue of internal validity, the findings of this study were limited to this population and setting and cannot be generalized. Given the scope of this study, it was limited to middle school students with ASD who attended the study site middle school in Missouri. This scope was a delimitation in that it rendered the results to not be generalizable beyond the study site school. This study was limited to the parents of seventh- and eighth-grade students with ASD from one middle school. Because this study included only the effects of PI on the reading achievement scores of middle school students with ASD, I did not investigate parents with neurotypical students or students with other special needs.

Limitations

I developed a survey instrument for data collection in this study; as such, the absence of reliability and validity for the survey measures presented a limitation. The quantitative design used also presented a limitation in that I did not seek to discuss the context of the relationship, only to assess if it exists. A third limitation was that in using the stimulus-response theory, this study only considered PI as the stimulus and reading achievement as the response. Other theories and contextual factors were outside the scope of this study. In using self-reported measures for PI, I identified that these measures could introduce validity issues because they cannot be confirmed as true. Finally, my role as the researcher and as a teacher in the study site school presented biases; however, I had no influence over the dependent or independent variables.

Significance

The findings of this study have the potential to advance understandings of the role of PI in reading achievement for middle schoolers with autism, which could help improve policies for this group. Reutebach et al. (2015) identified that more evidence is needed to understand the reading challenges of students with ASD to improve policies and programs designed to improve reading skills; consequently, the results of this study could contribute to this currently limited body of evidence. More specifically, the significance of this study is that it addresses a gap in knowledge related to the relationship between PI and reading achievement for middle schoolers with autism. In doing so, this study may have implications for practice because the findings can inform the strategies recommended for improving reading achievement in the target population. If the

relationship between PI and reading achievement is found to be significant, this information can be used to guide parents and inform reading programs that support PI. In advancing knowledge and improving practice, the study has the potential to affect social change if it is used to improve educational outcomes, namely reading for middle school students with ASD.

Summary

In this study, I assessed the relationship between PI and the reading scores of middle school students with ASD. Some researchers have shown the importance of providing elementary-level children with reading material at home (Barton et al., 2007; Hawes & Plourde, 2005; Roberts & Wilson, 2006), but this has not been studied at the middle school level. Because the extant literature did not include middle school children with ASD (Hawes & Plourde, 2005), there is a need for additional inquiry into the relationship between PI and the reading scores of middle school students with ASD. To address this gap in knowledge, I conducted a quantitative study with a correlational design using survey data collected from parents and correlating it to their child's growth in reading test scores. I used the survey results to test the hypothesis that PI significantly correlates to improved reading scores in middle school students with ASD. Thorndike's stimulus-response theory on the transfer of learning was used in this study to show how it applies to students with ASD and their reading responses to parental stimuli triggers.

This chapter included the problem statement, the purpose of the study, and the research questions. In this chapter, I also presented the theoretical framework, the nature of the study, definitions of terms, assumptions, scope and delimitations, limitations,

significance, and the impact on social change. Chapter 2 included a literature review on the conceptual framework, ASD education, and why PI is essential for increasing all students' reading achievement scores. Additionally, I will present the major themes and gaps in the research and describe how this study filled the research gaps. In Chapter 3, I will present the study methodology. Chapter 4 will include the study results. A discussion of the findings, conclusions, recommendations, and implications for further research are in the fifth and final chapter of this study.

Chapter 2: Literature Review

In this chapter, I provide an overview of the literature on PI and the reading achievement of middle school students with ASD. Although Chapter 1 showed the need to study PI and the reading achievement scores of neurotypical elementary-level students, there is limited research on middle school students with ASD. In this chapter, I present a justification of the problem and the gap in the literature. According to the U.S. Centers for Disease Control and Prevention (CDC, 2017), ASD diagnoses have increased at an unprecedented rate in the past 20 years. One in 150 eight-year-old children has received a diagnosis of ASD, representing a 500% increase in the last decade (CDC, 2017). The literature indicated little, if any, research on the relationship between reading achievement for children with ASD and PI, as either the number of hours parents spend reading with their children or the number of books present at home.

Literature Search Strategies

I conducted literature searches using the following electronic research databases accessed through the Walden University Library website: Academic Search Premier/Complete, A SAGE Full-Text Collection, Educational Resource Information Center, Expanded Academic ASAP, ProQuest Dissertation and Theses, ScienceDirect, and SocINDEX with Full Text. I used appropriate keywords in each database to find literature on student success, PI, reading scores, special education students, autism, ASD, and learning disabilities. Google Scholar, dissertations, reference lists of other articles, websites of professional organizations, and the web were also searched. The keywords and combinations of keywords searched were *special education, autism, middle school*

students, parental involvement, reading achievement scores, national reading scores for students with learning disabilities, and *why students fail to improve reading at the middle and high school levels.*

Theoretical Foundation

The theoretical foundation for this study was Thorndike's (1932) stimulus-response theory on the transfer of learning, which is based in the tenets of: (a) law of effect: responses to a situation (e.g., parent reading to student), followed by a reward to strengthen; (b) law of readiness: a series of responses can connect to satisfy a goal; and (c) law of exercise: connections strengthen with practice. According to Hommel (1998), the idea of stimulus-response bindings is a central characteristic of stimulus-based action regulation. Furthermore, whenever a response is given to a stimulus, the mental codes become integrated and result in episodic stimulus-response bindings and stored in memory. The stimulus repetition triggers the retrieval of the response that was bound to the stimulus. The response then facilitates or impedes performance, depending on if the retrieved response is appropriate or not on the current trial (Hommel, 1998).

Some cognitive theorists believe learning associations are made by reorganization of sensory-perceptual processes (Holland, 2008). By contrast, theorists such as Guthrie, Thorndike, and Hull posited that learning involved stimulus-response associations (Holland, 2008). Spence (1950) pointed out, however, that Hull's emphasis on stimulus-response associations followed from neurophysiologizing rather than from the mathematical definition of habit. Spence further argued that learning and motivation

factors influence behavior and, more precisely, habit strength and drive influence behavior.

Pavlov (1906, 1927) demonstrated that through the simultaneous presentation of an unconditioned stimulus (i.e., meat paste) and a conditioned stimulus (i.e., sound from a tuning fork), the conditioned stimulus would eventually come to elicit a response (i.e., salivation) that initially could be elicited only by the unconditioned stimulus. The response of salivation to the sound of the tuning fork was referred to as a conditioned response (i.e., reflex). This process of conditioning became, in the hands of several United States psychologists, a means of conceiving of behavior so that the dangers of subjectivity could be avoided, and for the first time, it seemed possible to build objective psychology that dealt only with observables (Pavlov, 1906, 1927).

Miller and Dollard (1941) further developed stimulus-response concepts in learning theory through the study of the circumstances under which a response and a cue stimulus become connected. Once learning is completed, a response and cue bind together where the appearance of the cue evokes the response. Then, learning takes place according to certain psychological principles. The connection between a cue and a response can be strengthened only under certain conditions. The learner is driven to make the response and rewarded for having responded in the presence of the cue (Miller & Dollard, 1941). The response may be expressed in a simple way by saying that to learn, an individual must want something, notice something, do something, and get something. Furthermore, these factors are drive, cue, response, and reward. These elements in the learning process have been carefully explored, and further complexities have been

discovered. Learning theory has become a firmly knit body of principles that are useful in describing human behavior (Miller & Dollard, 1941, pp. 1-2). In general, then, a drive is a potent stimulus that impels the individual to behave or respond in some manner until the stimulus is reduced or eliminated. Learning consists primarily of developing efficient means of reducing drive stimuli.

According to Giesen et al. (2020), to date, a burgeoning number of findings attest that storage and retrieval of these episodic stimulus-response bindings are pervasive principles of action regulation and apply to a broad scope of stimuli and responses. Because of its application in learning, the stimulus-response theory has been used to study learning of relevance to the current study, such as for understanding of whether vocabulary is learned and decoding for bilingual students (Raudszus et at., 2018) and the value of computer programs for teaching high school reading for teaching sight words to students with intellectual disabilities (Cazzell et al., 2019). Because Anindvarini et al. (2018) demonstrated the applicability of stimulus-response theory in their study of learning skills in storytelling and found that it is an effective lens for understanding the learning achievement through practice, the theory was suitable for the current study on the effect of PI on reading achievement for middle school students with ASD. In this study, I hypothesized that it is through repetition of the stimulus that there is greater response as the student unconsciously responds to the learning situation.

Student Academic Success

The definition of academic success has changed over the years and continues to evolve (Steinmayr et al., 2017). Students, parents, and educators all have different ideas

of what constitutes success. For example, students may define academic success as earning a specific grade point average to attend their desired colleges. For parents, academic success may include students passing all classes, graduating, and entering the workforce (Steinmayr et al., 2017). Academic success is a somewhat subjective and broad term based on who is providing the definition. Success may include many academic achievements personal to the individual. However, students can achieve any type of academic success only with determination and due diligence (York et al., 2015). For example, if a person struggles academically due to learning difficulties, that person may define academic success as advancing to the next grade. Additionally, a student who excels in school may strive for academic success by earning high marks to win a scholarship to an esteemed and highly sought-after college. Although both goals of academic success vastly differ, they require an equal amount of hard work and dedication (York et al., 2015).

Researchers have also defined academic success through "grit" or "perseverance," terms that indicate that long-term goals are significant predictors of academic success. In a study on 2,321 twin pairs, Rimfeld et al. (2016) used the Grit-S scale (which measures perseverance of effort and consistency of interest) and the Big Five personality traits to predict scores on the General Certificate of Secondary Education (GCSE) exams. Twin analyses of grit perseverance provided a heritability estimate of 37% (i.e., 20% for consistency of interest) and no evidence of shared environmental influence. Personality, primarily conscientiousness, contributed about 6% of the variance in GCSE grades, but grit added little to this prediction. Moreover, the analyses showed that roughly two thirds

of the GCSE prediction was genetic. Rimfeld et al. found that the traits of grit perseverance of effort and Big Five conscientiousness were, to a large extent, the same trait both phenotypically ($r = 0.53$) and genetically ($r = 0.86$). The researchers concluded that the etiology of grit is highly similar to other personality traits. Grit not only showed substantial genetic influence but also indicated no influence of shared environmental factors (Rimfeld et al., 2016).

According to Benner et al. (2016), student success is linked to parental educational involvement in primary and secondary school. However, less is known about the long-term effects of parental involvement. Benner et al. identified four aspects of parents' educational involvement (i.e., home- and school-based involvement, educational expectations, and academic advice) and young people's proximal (i.e., grades) and distal academic outcomes (i.e., educational attainment). In addition to identifying the aspects, attention was also placed on whether these relations varied as a function of family socioeconomic status (SES) or adolescents' prior achievement. Their results showed there were significant links between both school-based involvement and parental educational expectations and adolescents' cumulative high school grades and educational attainment.

Grit might be more malleable when compared to intelligence, SES, and academic achievement predictors (Duckworth & Gross, 2014). Duckworth and Gross assumed that grit originated in family values and, thus, would be more influenced by training. According to Moffitt et al. (2011), when compared with cognitive factors or SES that are tough to amend, Duckworth and Gross's assumptions may be premature for three

reasons. First, all personality traits show similar heritability. Second, previous research showed that personality traits are affected by nonshared environments that include influences that do not contribute to similarities among siblings who grew up in the same family and attended the same school, not by shared environments (Duckworth & Gross, 2014). Third, Duckworth and Gross were not aware of any studies that showed the effects of training grit. Even though there is a lack of empirical evidence in training, the U.S. Department of Education set grit as a priority (Rimfeld et al., 2016). Furthermore, little research is available on why children differ in grit or how grit correlates with educational achievement. Although there may not be a direct relationship between grit and educational achievement, the twin studies and the associations between educational achievement and Big Five traits show an association between genetic factors and environmental factors (Krapohl et al., 2014; Luciano et al., 2006).

ASD and Academics

According to McConachie et al. (2015), the needs of children with ASD tend to be complicated, which is reflected in many diverse academic outcomes, such as improvement in core ASD impairments in communication, social awareness, sensory sensitivities, and repetitiveness. These challenges are also noted in skills such as social functioning and play (McConachie et al., 2015) as well as in increased levels of anxiety (Simpson et al., 2019). According to Keen et al. (2016), there has been very little attention from researchers on the academic achievement of individuals with an ASD, despite the importance placed on this by schools, families, and students with ASD. In their review of the literature, a total of 19 studies were identified that met the inclusion

criteria for the review. Their results indicated that many individuals demonstrate specific areas of strength and weakness, and there is a great deal of variability in general academic achievement across the autism spectrum (Keen et al., 2016).

McConachie et al. (2015) discussed how comprehensive early intervention programs based on the principles of applied behavior analysis promote social communication development in children with ASD. The authors conducted a systematic review to document which intervention targets and assessment tools were used to measure spoken language outcomes for children with ASD receiving comprehensive intervention programs. Although social communication functioning was the most frequently targeted aspect of development, no studies included sampling and analysis of the children's spoken language in daily activities. The lack of comprehensive measures with high ecological validity limits the ability to conclude spoken language outcomes from the studies (McConachie et al., 2015). Similarly, Trembath et al. (2016) found that interventions are important for improving long- and short-term communication for children with ASD. Finally, Miller et al. (2016) discussed the importance of early intervention for students with ASD to mitigate weaknesses in reading comprehension.

Kim et al. (2018) examined how early predictors of and changes in school-age academic achievement and class placement in children with autism. The study found that academic skills varied widely at 9 and 18 but were mostly commensurate with or higher than expected given cognitive levels. However, 22% (age 9) and 32% (age 18) of children with average/above-average IQs showed below/low average achievement in at least one academic domain. Children who remained in general education/inclusion

classrooms had higher achievement than those who moved to special education classrooms. More persuasive cognitive skills at age 3 and 9 predicted better academic achievement and fostered academic growth from age 9 to 18. Parent participation in intervention by age 3 predicted better achievement at age 9 and 18 (Kim et al., 2018). Many children with ASD achieve necessary academic skills commensurate with or higher than their cognitive ability. However, more rigorous screening for learning difficulties may be necessary for those with average cognitive skills because a significant minority show relative academic delays. Interventions targeting cognitive skills and parent participation in early treatment may have cascading effects on long-term academic development (Kim et al., 2018).

Fleury and Hugh (2018) described how reading aloud to children promotes emergent literacy and language skills that form future reading success. In a study involving shared book reading practices between caregivers and their children with ASD, Fleruy and Hugh identified factors that could promote or inhibit a child's engagement in reading. The results proved that when caregivers and their children read a variety of books, children with ASD demonstrated a lower level of engagement when reading independently, while a higher level of engagement when the caregiver read the book.

According to Westerveld et al. (2017), a high percentage of students with ASD have difficulties in reading, which leads to an academic disadvantage. Furthermore, there may be a connection between these difficulties and the differences in children's emergent literacy development in the preschool years. Westerveld et al. examined the relationship between emergent literacy skills, language ability, broader cognitive, autism severity, and

home literacy environment factors in 57 preschoolers with ASD. During the study, some children showed strengths in code-related emergent literacy skills such as alphabet knowledge but showed significant difficulties with meaning-related emergent literacy skills. The study results also showed a significant relationship between meaning-related skills, autism severity, general oral language skills, and nonverbal cognition (Westerveld et al., 2017).

According to Whalon (2018), children with ASD have difficulties developing joint attention, language/communication, joint attention, and social reciprocity. Children with ASD face many challenges and are at risk for future reading failure. Research suggests that many school-aged children with ASD will learn the decoding skills necessary to read the text effectively but will struggle with comprehension (Whalon, 2018). Nevertheless, the reading profiles of learners with ASD show significant heterogeneity, while some also cannot effectively decode new words. There is a vast range of difficult challenges children with ASD that highlight the need for a robust, comprehensive literacy/reading instruction that addresses both code and meaning-focused skills from the earliest grades. For students with ASD, providing effective interventions that support the code- and meaning-focused skills of learners with ASD is vital to educational success (Whalon, 2018).

Dynia et al. (2016) suggested that children with ASD struggle with reading. When there was an increased focus on emergent literacy skills-particularly print knowledge-might, reading outcomes might improve later (Dynia et al., 2016). The study used a longitudinal measure of print knowledge (i.e., alphabet knowledge and print-concept

knowledge) for 35 preschoolers with ASD relative to a sample of 35 typically developing peers and found that children with ASD had comparable alphabet knowledge, lower print-concept knowledge, and acquired both skills at a similar rate. These findings suggest that children with ASD are unlikely to acquire print-concept knowledge commensurate to their peers without an increased emphasis on high-quality instruction that targets this skill (Dynia et al., 2016).

The academic achievement of students in schools is subject to a variety of factors, many of which are beyond the control of the student (Avnet et al., 2019). Some of the many factors that impact a student's ability to do well in school include parental involvement, parental level of education, and disability all influence the academic achievement and learning of students (Avnet et al., 2019). In a study conducted by Avnet et al. the researchers analyzed nation-wide survey data on students in elementary school and investigates the relationship between student achievement and multiple variables. The variables were parental involvement and the existence of ASD or other disability. Results indicated that students, both ASD and typically developing, have lower parent involvement if they are successful in school (Avnet et al., 2019).

Home Factors Associated With Academic Success

Many people view the task of developing children's reading skills as the purview of formalized education; however, the quality of the home environment indicates reading outcomes and the development of early literacy skills (Burgess et al., 2002; Griffin & Morrison, 1997). A child's temperament and behavior (e.g., attention problems, impulsivity) may also indicate the development of reading skills (Rabiner et al., 2016;

Spira & Fischel, 2005). According to Taylor et al. (2017), it would be beneficial to combine and capture the collective predictive power of the numerous child-level variables associated with reading skills. Moreover, it would be useful to employ strategies that do not just combine variables, but strategies that indicate unique variances in reading performance, thereby providing potential intervention targets. Furthermore, the researchers stated that this way, it was possible to develop "risk scores" that combine salient risk factors into single scores. Combining salient risk factors into single scores may help school administrators translate research findings on risk into practice in schools and clinical settings. Educators can consolidate risk variables into a single indicator that could be used in conjunction with other information to identify children who may need additional assessment or intervention. The goal of the present study is to characterize the risk of child-level home factors, child-level temperament, and behavior dimensions into a single score that could indicate a vital reading outcome (Taylor et al., 2017).

The home environment provides an essential context for academic support. However, educators and clinicians can use aspects of a child's behavioral or psychological functions for reading comprehension to create a separate risk aspect index that may complement or interact with the home environment risk. Individual differences in temperament (influences thoughts, emotions, and behaviors) may indicate academic achievement (Taylor et al., 2017). Besides, when one imagines an academically impoverished home environment, it is easy to focus on SES as a significant contributing factor because SES indicates academic achievement and literacy. Children from more impoverished families tend to have lower achievement contexts for reading achievement,

which includes more than classrooms and teachers. Lower achievement contexts also incorporate the child's temperament, behavioral characteristics, and means of interaction with the environment (Taylor & Hart, 2014).

Taylor and Hart (2014) captured the complexity of the numerous factors that may affect reading comprehension and consolidated them into single metric indices. Parental expectations on educational achievement were the most substantial element of the home environment index; accordingly, these expectations may be useful as an individual target for prevention and intervention. Parents may not realize the impact their attitudes and beliefs have on their children's academic achievement. The child's level of positive and negative emotionality was the most powerful indicator in the behavioral index, which shows that parents may be able to spot risk factors before their children begin school (Taylor & Hart, 2014). The behavioral and environmental indices showed similar magnitude effects as teacher quality and instruction on reading-related outcomes, thus indicating the importance of considering individual child-level differences when examining reading performance. Finally, teachers and clinicians could use consolidated risk metrics to translate research into practice and provide tools to screen children for intervention or further assessment of reading and reading-related problems (Taylor et al., 2017). Similarly, Domitrovich et al. (2017) discussed that recognizing these risk factors are important for informing appropriate interventions.

Reading and Academic Success

Armstrong (2011) defined academic success as high school graduation, with the chances of graduating high school predicted with reasonable accuracy by how well a

student reads by the end of third grade. Reading difficulties, in turn, cause a host of negative consequences, including academic failure, poor self-concept, substance abuse, truancy, delinquency, or limited employment opportunities (Beitchman et al., 2001; Kirk & Reid, 2001; Spear-Swerling & Sternberg, 1996).

Stinnett (2014) found that students from higher economically advantaged homes significantly outperformed students from lower socioeconomic families in academics. Stinnett also identified the difference in academic achievement as primarily due to the availability of resources. Students from more impoverished families did not have the same opportunities as their more economically stable counterparts. Hagans and Good (2013) noted that children from low socioeconomic backgrounds struggled to read and experienced persistent learning problems with potentially long-term consequences. Students must obtain literacy skills to excel and become productive citizens. Students' access to educational resources indicates their success. It is the school systems' responsibility to provide the resources needed for all students' success. (Holder et al., 2017)

Lack of early literacy exposure was a recurring theme in Holder et al.'s (2017) study. Participants shared that not exposing students to literacy in their early years inhibited their reading achievement. The participants' beliefs were consistent with Ferguson (2014), who argued that toddlers should engage in early literacy activities with their parents. According to the Annie E. Casey Foundation (2014) report, most brain growth occurs in the early years of life and provides the foundation for later learning and

achievements. Shue et al. (2012) stated that children's early experiences have a lifelong impact; therefore, children need early literacy exposure to succeed in reading.

The administrators from a Title 1 elementary school in North Carolina perceived family support as one of the major contributing factors to reading achievement and implied that early learning experience was essential for reading proficiency. Participants voiced that family support was a predictor of reading success. Through a regression analysis of pre and post testing, Chansa-Kabali and Westerholm (2014) found that family support was essential for a child's reading progress. Ferguson (2014) suggested caregivers should praise children's efforts if they want their children to succeed in difficult tasks. Williams et al. (2013) supported the administrators' perceptions that students succeed if they have nurturing and respectful families. Dexter and Stacks (2014) similarly reported that parent-child relationships are significant for reading achievement.

Reading Achievement

According to the National Education Association (2004), states require reading assessments because reading is critical in academics. However, many students do not show adequate reading proficiency in their yearly assessments. Reading is vital for both learning and achievement. Students learn to read in the primary grades, with difficulties becoming apparent in elementary school and profound when children enter high school (Fisher & Frey, 2007). Kamps and Greenwood (2005) believed that educators must address strategies on formulating, delivering, sustaining, and managing secondary level reading interventions, including issues of validation, school resources, and costs. Also, both state and federal laws provide regulations on holding all students and teachers to

higher academic standards. As educators implement the mandates, schools become collaborative and inclusive, although existing organizational barriers often present barriers to adequate practice.

Yakimowski et al. (2016) stated that any child who is not a modestly skilled reader by the end of third grade is unlikely to graduate from high school. Slavin et al. (2010) demonstrated that elementary students without solid reading skills were at risk of dropping out by middle school. Schools with higher percentages of ethnic minorities and students whose primary language is not English have a significant concentration of students with reading difficulties. Reading is a critical developmental process that requires individuals to build on prior knowledge to acquire increasingly difficult skills. Learning to read is a fundamental academic objective that has wide-ranging implications for later academic achievement, economic success, and other adult endeavors such as communication via technology (National Early Literacy Panel, 2008; Torgesen, 2002). Learning to read is a normative part of human development, as long as children accomplish age-related developmental milestones and are not prevented by sensory, perceptual, cognitive, and social skills deficits in early childhood (Snow et al., 1998). Children acquire the foundational skills to support reading development through exposure to written, print, and spoken language, and caregivers' model literate behaviors long before children begin reading (Snow et al., 1998). Children learn to distinguish sounds in spoken language through these experiences (e.g., phonemic awareness; Ehri et al., 2001), noting that symbols in the alphabet represent sounds and, when put together, create words (e.g., master alphabetic principle; Chall, 1983).

Reading is an area of concern across the United States. The National Education Association's (2008) Task Force indicated that educators foster reading achievement through differentiated instruction using ratios that are not always equal. State assessments show that more students read below their grade levels compared to students in 1998. Most of the research conducted thus far primarily shows that regular education children do not meet adequate yearly progress indicators. Relatively few studies show effective practices for struggling readers or special needs students (Brownell et al., 1993). However, schools are placing an increasing number of special needs students in remediation classes in hopes of increasing their reading scores on state exams. Examining the degree of effectiveness applicable to inclusive education or mainstreaming intervention is complicated by factors such as individual participants (e.g., severity or persistence), intervention definition, and the methodology used to evaluate the process (e.g., case study, correlational research, comparison groups; Lindsay, 2007).

McIntyre et al. (2017) conducted a study to identify readers' unique profiles in a sample of 8 to 16-year-olds with higher functioning autism spectrum disorders (HFASD) and examine the profiles with ASD symptom severity. During the study, 81 students were assessed utilizing a comprehensive reading battery that included basic word reading, language, and comprehension. An analysis was conducted to assess if significant differences existed between profiles as a result of ASD symptomatology. McIntyre et al. found that the heterogeneous nature of reading profiles in students with HFASD and significant differences between the reading profiles and ASD symptom severity.

PI

PI in primary and secondary school strongly indicates students' academic success; however, less is known about PI's long-term effects (Benner et al., 2016). Furthermore, parents who support their children promote students' psychological well-being (Roksa & Kinsley, 2019), improving social adjustment and academic performance in school (Serna & Martinez, 2019). Good readers come from psychologically comfortable home environments and caregivers who foster positive attitudes toward reading and learning and provide stimulating cultural and language experiences (Beatson, 2000). PI is the most effective way to improve reading achievement scores. Garcia et al. (2014) stated that the more frequently reading occurs, the greater children's increase in readiness; limited reading within the home often has a negative impact on reading scores. Parents may not get involved for several reasons. For instance, numerous researchers have acknowledged and supported the lack of PI in children's education (Garcia & Thornton, 2014; Simmons-Morton & Crump, 2003; Vaden-Kiernan, 1996). The majority of research shows how reading impacts elementary-level children but is limited or nonexistent on middle school students.

Hawes and Plourde (2005) stated, "There is evidence that supports a relationship between higher student achievement levels and parents who strive who strive to provide school-based learning materials and books to their young children at home" (p. 52). Students benefit from reading at or above their grade levels. PI and teacher involvement are essential for students' success inside and outside of the classroom. Akiens and Barbarin (2008) examined the extent to which family, school, and neighborhood factors

account for the impact of SES on children's early reading skills to provide background knowledge on the importance of reading. The findings imply that multiple contexts combine and are associated with young children's reading achievement and growth and help account for the robust relation of SES to reading outcomes (Akiens & Barbarin, 2008).

According to the Scholastic Kids and Family Reading report, parents who serve as reading role models or provide many books in the home increase children's reading frequency more than their household income. Furthermore, income is a significant factor in the relationship between PI and reading achievement success (Matthews et al., 2017). Li and Fischer (2017) argued that there is a rural deficit in this relationship, as rural residents are less likely to interact and develop social networks for children's education in formal settings. According to Bridges (2014), parents who use interactive strategies influence their children's language and cognitive development. When parents spend time reading and providing book awareness, their children develop robust vocabularies and experience more academic success at ages 9 to 10 years. Garcia and Thornton (2014) stated that even though the public education system has changed since 1921, family engagement remains essential to student achievement. Furthermore, when parents get involved in their children's school, both parents and teachers see improved performance, reduced absenteeism, and restored parental confidence in children's education. The children of involved parents or other caregivers have better social skills, higher grades, improved test scores, and better behavior than children with uninvolved families.

Similarly, Dykstra et al. (2015) found that home engagement is important for improving interventions for students with ASD.

Parveen et al. (2016) conducted a study to examine how PI impacts a child's education. The authors were interested in who was responsible for a child's learning. The research aimed to explore aspects of the child's education and development to PI. Two questionnaires were used for gathering data from the field from parents and students. Findings suggest that PI is beneficial and effective in bringing out children potentialities. The findings also show that parents do not directly involve themselves in the teaching-learning process (Parveen et al., 2016)

Gilkerson et al. (2017) sought to determine whether reading to young children might indicate higher familial language interaction than not reading to them. Early language development is a strong predictor of reading competence. Gilkerson et al. were not sure if reading to young children would enhance the language interaction between children and their parents. They found that language use by adults was higher during book reading, but more importantly, the rate of conversational engagement was much higher, as well. Thus, Gilkerson et al. recommended parents read to and with their children from an early age. Some parents may not realize how talking while reading to children can have a profound effect on children’s subsequent language and reading capabilities (Gilkerson et al., 2017).

According to Hamlin and Flessa (2016), with promoting PI as a mechanism for improving student outcomes, few jurisdictions have provided funding for this priority. In Ontario, Canada, the province’s Parents Reaching Out Grants program allows parents to

apply for funding for a PI initiative that addresses a local barrier to parent participation. Results from the study showed several key contextual differences, parents across settings identify relatively similar needs for enabling parental involvement, emphasizing parenting approaches for supporting well-being (e.g., nutrition, mental health, and technology use) and skills for home-based learning. However, Epstein's widely used PI typology conceals these prominent aspects of PI (Hamlin & Flessa, 2016).

Anderson (2000) discovered that PI at the elementary level indicated improved reading comprehension levels. Furthermore, the results showed a reduction in reading levels when parents reduced the amount of time they spent reading with their students at home. Regardless of income, gender, or family status, PI in children's education is essential (Anderson, 2000). Merga and Roni (2018) surveyed 997 youth participants to examine the correlations between reading, gender, and PI. The researchers found considerable variation in parental encouragement, including that girls received more encouragement than boys, but that both genders experienced limited parental reading modeling.

To improve all students' reading achievement scores, including the scores of students with ASD, further research is needed at the middle-school level. PI is critical for students' overall academic achievement and learning processes. Therefore, all parents play a vital role in their children's academic success from elementary through middle school and high school. PI is still crucial for middle school students; however, PI levels in middle schools are not as high as in elementary schools. PI is essential for students in all grade levels, from kindergarten through high school. However, PI is especially critical

during middle school because young students still need parental support, advice, and encouragement (Dwyer & Hecht, 2001). Parental participation correlates with improved academic achievement (Barnard, 2004; Desimone, 1999; Hill & Taylor, 2004). Henderson and Berla (1994) posited that when schools and families collaborate to enhance learning, students excel not only in school but also throughout life (Oates, 2017). Furthermore, as crucial as PI is in middle schools, PI levels in middle schools are not as high as in elementary schools (Oates, 2017). Epstein (2011) stated that parental engagement in middle schools indicates improved student achievement, attendance, learning outcomes, and overall school success. Furthermore, Walker (2016) supported the concept that parents' beliefs, perceptions, and aspirations for their children contribute to PI levels in school.

Karıbayeva and Boğar (2014) stated that PI is crucial for children's academic success, especially in primary and middle schools. Furthermore, PI can have a positive or negative impact on children's academic perceptions of their lives and language abilities. Today, parents are not engaged in how their children are doing in school. Reasons for low involvement include a lack of education, work commitments, students not wanting their parents involved, and a lack of communication between the parents and the school (Karıbayeva & Boğar, 2014). Because some parents are hesitant, unable, or unwilling to be involved, there must be research on school initiatives to fill this gap.

Lehrl et al. (2019) explored whether a child's early exposure to books and verbal interaction indicated future academic learning. Findings showed that when parents exposed children to books early in life, either by owning books or reading to their

children, the quality of verbal reading content during shared book reading improved (Lehrl et al., 2019). For parents who did more than just read to their children, the quality of verbal interaction was associated with learning outcomes at age 12 years after controlling for child and family background characteristics. Reading comprehension at 13 years of age was indirectly affected by formal literacy activities, the quality of verbal interaction, and book exposure during shared book reading via letter knowledge and language competencies at the end of preschool. Furthermore, secondary school form and home learning environment additionally revealed variances in reading levels at age 13 years (Lehrl et al., 2019).

PI and Reading Achievement Scores

It is vital to encourage parents to support reading and get involved with their children's education. Parents are the first teachers before children enter the school system. The home environment is essential to children's academic success because it provides children with a permanent environment and point of reference (Szabo, 2019); therefore, PI is critical. Parents must set priorities, show consistent interest, communicate values, and praise and encourage their children's academic success (Garcia & Thornton, 2014). Knoche and Davis (2016) studied interventions that connect home and school literacy efforts. Focusing on preschool programs, they found few successful initiatives for promoting PI. They concluded their study with recommendations for science-based literacy opportunities that included training and curriculum (Knoche & Davis, 2016). Alternatively, Erdener and Knoeppel (2018) studied methods for providing parents with reading guidance and found that these efforts had positive impacts on shared reading. The

PI of parents with special needs children differs from the PI of parents of children with regular school schedules. PI for both groups of parents is essential for the success of their children's social, academic, and physical development. Parents with special-needs children have different relationships with their children than parents who have interactive relationships with children without special needs (Inevatkina, 2015).

PI is an essential indicator of students' academic success (Baharudin et al., 2010; Epstein et al., 2009; Herrell, 2011; Pattanaik & Sriram, 2010); however, parents may find it challenging to establish positive relationships between school and home life. Although PI is crucial in children's education, there is a great diversity of thought and opinion on PI. Parents come from diverse backgrounds, and they have just as diverse personal experiences in education. Parents' relationships with education indicate their attitudes and interaction levels with their student's education, relationships with teachers, and their overall views on education (Hornby & Lafaele, 2011). Involvement with reading activities at home has significant positive influences not only on reading achievement, language comprehension, and expressive language skills (Gest et al., 2004), but also on pupils' interest in reading, attitudes toward reading, and attentiveness in class. PI in children's literacy practices is a more powerful force than other family background variables such as social class, family size, and parental education levels (Flouri & Buchanan, 2004). Reading enjoyment is more important for children's educational success than SES (Organisation for Economic Co-operation and Development [OECD], 2002).

Hawes and Plourde (2005) examined the effects of PI on elementary-level children. Parents who read to their children saw a slight increase in reading scores. According to Hawes and Plourde, a correlation exists between improved reading elementary-level reading achievement scores and PI. Duignan et al. (2002) noted that PI indicated improved reading achievement scores in elementary children; when parents were not involved, scores decreased. In Duignan et al.'s study, students received pre assessments and post assessments to identify any reading improvement. Over 70% of the students who participated in the pre assessment scored at least 50% or higher on the post assessment, and 81% of the students scored at or above 50%. The results may have been higher with more PI during the study (Duignan et al., 2002).

Khajehpour and Ghazvini (2011) conducted a study on 200 male students in Tehran to examine the impact of PI on children's academic performance. During the investigation, parents described how they participated in their children's education, describing home involvement, volunteering, attending parent classes, school political participation, and talking to staff and teachers. The researchers collected the data via PI questionnaires and academic performance grades. Khajehpour and Ghazvini noticed that, when parents were more involved with their children's education, their children had better grades. The researchers hoped that the results of this study would give parents and educators a better understanding of how PI affects children's performance (Khajehpour & Ghazvini, 2011).

According to Jelas et al. (2016), positive correlations exist between parent-child interactions, responsive parenting practices, and stimulating reading achievement. These

connections are essential influences on a child's academic development (Christian et al., 1998; Committee on Early Childhood Pedagogy, 2000). The amount of parental support students receive predicts their levels of growth and academic achievement. The amount of support either positively or negatively impacts the effort students put into academics and school activities (Jelas et al., 2016). Although the need for support is clear, parents face increasing demands of maintaining work and home life responsibilities. Despite these challenges, parents and educators must work together to maintain the balance, which is one of the central factors in understanding how PI better supports student learning.

Parental Attitude Toward Reading

A parent's negative attitude toward reading may result in decreased involvement during the middle school years. Matthews et al. (2017) argued that, despite some beliefs, parents of all social classes want to be involved. However, low SES parents struggle more with PI. According to McKenna et al. (1995), a child's negative attitude toward reading leads to low reading scores. When parents have negative attitudes toward reading, they similarly influence their children's attitudes; as a result, the child will score lower on reading achievement tests. McKenna et al. discussed how social structure, beliefs, and attitudes toward reading can result in either a positive or negative outcome for reading proficiency. When parents read in the home and exhibit positive attitudes toward reading, children develop the same positive attitudes, which might result in higher comprehension scores.

Ozturk et al. (2016) asked 94 elementary school children and their parents to complete the Literacy Attitude Scale and discovered a strong correlation between parent scores and child scores. Moreover, they found that the frequency of parent-child interactions indicated the strength of this relationship. Parents may have better attitudes toward reading with elementary school children because younger students are more likely to enjoy reading (Ozturk et al., 2016). In middle school, when reading material becomes harder and more intense, students may avoid reading, which results in lower reading scores. Thus, elementary school children receive more parental support and PI than middle school students. Once a child reaches middle school or high school, parents may become less supportive and involved with their children's education (Hawes & Plourde, 2005).

PI in Middle School

A relationship exists between reading performance and PI during elementary school, but research is limited for middle school students. According to Epstein (2011), an essential aspect of the problem of poor middle school readers is the question of how much PI is appropriate at this grade level. Younger children often get interested in reading by listening to their parents read to them. A parent who listens to a child reading helps the child to develop necessary reading skills. These activities often abate at the middle-school level yet are still essential to a child's learning. School administrators' efforts to involve parents decrease as children become adolescents and enter middle school (Barber & Patin, 1997; Berger, 1991; Epstein, 1996; Vaden-Kiernan, 1996). There are three possible reasons for this decline: teachers' beliefs about child development

(Patel & Stevens, 2010), parents do not feel welcome at middle schools (Barber & Patin, 1997; Lawson, 2003), and older children do not want their parents to be involved (Barber & Patin, 1997; Vaden-Kiernan, 1996). The SES of families, the educational levels of the parents, parents' marital status, and the number of children living in the home may affect PI levels.

Children are more inclined to read during elementary and high school, but no studies show if this is true for middle school students. Hawes and Plourde (2005) found that studies show the effects of PI on young children and their school experiences. There are, however, few studies that present the effects of parent-school relationships on children's later development. Ivey and Broaddus (2000) learned that middle school students read less and develop negative feelings about reading. Middle school students are also impacted by a lack of books and low or no PI (Baker, 2002).

The Gap: Reading Achievement, PI, and ASD

Reading skills, especially in the content-driven classrooms of secondary schools, are essential for student success. Federal law requires states to implement high stakes testing in reading, writing, and mathematics. According to the National Reading Panel (2017), nearly 1 in 5 U.S. students demonstrates reading problems by third grade, and 64% of students are not proficient readers in eighth grade (National Assessment of Educational Progress, 2017). Students identified early as poor readers continue to experience reading difficulties in later grades (Francis et al., 1996; Juel, 1988), whereas students who develop early preliteracy skills and reading proficiency continue to read proficiently and at a fast pace as their vocabulary grows, which increases the achievement

gap (i.e., the Matthew effect; Snow et al., 1998; Stanovich, 1986). Although 5% of all students with limited reading proficiency have a learning disability, they comprise the majority of students who receive special education services (Data Accountability Center, 2012). Notably, difficulty in reading is the most common (Cortiella & Horowitz, 2014), affecting 75% to 80% of students with a learning disability (Lerner, 1989).

A few studies show the longitudinal reading achievement gaps for students with learning disabilities but do not include students with ASD (Levy et al., 2006; Wei et al., 2011). Furthermore, the researchers of these studies did not control for differences in sociodemographic variables, which Robertson (2017) argued is an important consideration in special education research focused on children with ASD. Furthermore, Roska and Kinsley (2109) highlighted the role of economic status in academic success, noting that lower-income students were substantially less likely to obtain a higher education degree. Studies show mixed findings, with two indicating substantial reductions in the achievement gap across grades (Levy et al., 2006; Wei et al., 2011).. Scarborough and Parker (2003) used both a reading composite and comprehension measure for students with learning disabilities, and Skibbe et al. (2008) used a composite reading measure and tracked students with language difficulties identified before school entry. Catts et al. (2008) discovered stable achievement gaps for both word recognition and reading comprehension for students with language impairments, and McKinney and Feagans (1984) found a widening achievement gap in reading comprehension for students with learning disabilities. In sum, studies on longitudinal reading achievement

gaps for students with disabilities are limited, restricted to only two specific exceptionalities, and do not consistently present a fan-spread pattern.

As the deficits in reading for students with ASD has been well-documented in the literature (Solari et al., 2017), PI is essential for students' reading achievement, including the reading achievement of students with ASD. Based on research on 111 students aged 4-7 with ASD, Tipton et al. (2016) found different levels of effectiveness of PI in regards to reading sessions. According to Klauda (2009), parental support is one of the positive elements needed for student success, especially for students with ASD. Wei et al. (2011) found that students with ASD showed a lower rate of reading proficiency, and in most cases, decreased comprehension. Students with ASD also displayed a slower growth rate when compared to other middle school students with special needs.

Keen et al. (n.d) researched how the academic achievement of individuals with ASD receives little attention despite the importance placed on their academics by educators, family members, and students with ASD. Investigating factors that indicate improved academic achievement is essential. Keen et al. presented research on the academic achievement of ASD children and adolescents. Studies show an underrepresentation of adolescents and individuals with lower IQ scores, with few scholars discovering the environmental factors that indicate academic success.

Summary and Conclusions

Many researchers have presented data on elementary and high school students, but few are specific to middle school students. Because of a lack of literature on PI and middle school students, I administered a survey to ask participants questions on PI levels

at home. There is a significant gap in the literature on PI and growth in reading achievement scores in middle school students with ASD. This study assessed the relationship between PI and the reading achievement scores of middle school students with ASD. I used the Star Reading Test to compare reading achievement scores at the beginning of the school year and at the middle of the school year. The next chapter presents the study's methodology.

Chapter 3: Research Method

In addition to the positive benefits of PI for special education students, PI is also key for effective interventions for children with ASD (Link, 2019). ASD interventions that include parents show positive outcomes by influencing the magnitude of child outcomes. For example, in the area of challenging behavior, children with ASD whose parents were directly involved in implementing behavior management displayed a significant reduction in problem behaviors (Levy et al., 2006, p. 59).

The purpose of this study was to determine if a relationship exists between PI and the reading achievement scores of middle school students with ASD. The results of this study may provide insight into how parents who read to their children and have books at home improve the reading comprehension scores of children with ASD. This chapter includes a discussion of the quantitative research methods used to analyze the relationship between PI and reading achievement scores. In this chapter, I also described the research design and rationale, the research question, the study setting, the target population and sampling, procedures for inviting participants, the data collection process, instrumentation, data analysis plan, the threats to validity, and ethical considerations.

Research Design and Rationale

Research Design

The research approach employed in this study was quantitative based on the appropriateness of this method for analyzing the guiding research question for this study. As such, the study relied on quantitative data collected through a survey I conducted of parents of middle school students with autism and through standardized reading test

scores. Researchers use the three research traditions: quantitative, mixed methods, and qualitative (Creswell, 2013). Qualitative research methods are appropriate to address the how and what of a phenomenon (Yin, 2016). With a qualitative approach, scholars collect data to introduce abstract knowledge and explore contexts of the studied phenomenon (Bansal et al., 2018). Quantitative researchers seek to examine relationships or group differences and provide specific, unbiased estimates of parameters of interest for the whole population (Hannigan, 2018). In mixed methods studies, researchers combine quantitative and qualitative methods because of the strengths of intersected methods (Angwin & Meadows, 2015). The qualitative approach was not suitable for this study because I did not explore a specific complex phenomenon within its real-world context (see Yin, 2016). The quantitative method was appropriate, however, because I identified the relationships among variables (see Creswell, 2013).

Within the quantitative tradition, I used a nonexperimental, correlational design using matched survey and testing data to assess the association between multiple independent variables and a single dependent variable. Correlational research designs are appropriate when the researcher seeks to understand the relationship between variables (Johnson, 2001; Kumar, 1999). Of the five correlational research designs (i.e., simple correlational design, partial correlational design, multiple correlational design, simple prediction design, and multiple prediction design), I employed the multiple prediction design in this study. Kpolovie (2018) explained that the multiple prediction design

> is the most elaborate of the five research designs… Multiple correlational research designs demand application of Multiple Regression statistical test for

> analysis of collected data to show the extent to which all the independent variables taken together can collectively, and taken separately independently, predict the dependent variable. (p. 119)

With the predictor variables in this study being two measures of PI and the outcome variable being reading achievement, multiple regression was the analysis used within the correlational design.

Appropriateness of Design

I conducted this quantitative correlational study to determine whether a statistically significant relationship exists between PI and reading achievement scores. The two independent variables were the amount of time parents spends reading to their children and the number of books available at home (both used to measure PI). The dependent variable was the change in reading achievement scores between two data points. Demographic data were included as control variables. This quantitative, nonexperimental, correlational design was appropriate because I measured the degree of association among variables and applied statistical analysis procedures (see Creswell, 2013).

Time Constraints

Because this study relied on data collected through standardized testing as a measure of reading achievement, there were time constraints that must be acknowledged. The design relied on student reading performance scores collected at the beginning and end of an academic semester. As such, time constraints were imposed by the school's academic calendar and implementation of the STAR Reading Test.

Methodology

Population

The population under study were middle school students with ASD. The target population was limited to middle school students with ASD who attended the study site school in Missouri. I drew the sample from this target population, which consisted of 30 students. The student population consisted of two girls and 27 boys. Of these, four are African Americans, one is Pakistani American, and 22 are European American. All but one student qualified for free or reduced meals at the middle school. All students had parents connected to the local military base with at least one parent serving in the military. Because data were collected from their parents and from the students' reading scores, the population is herein referred to as a parent-student dyad. I considered each dyad to be one observation in the sample. Because of the limited number of students meeting the inclusion criteria of having an ASD diagnosis and attending the study site middle school, all parents whose children met the criteria for the target population were invited to participate.

Sample Size and Sampling Procedures

I used a criterion power analysis because the target population size was known. In this study, there were 30 students in the study site middle school who met the inclusion criteria; therefore, the criterion power analysis was computed using alpha, the desired power, the desired effect size, and the population size. Using G*Power 3.1 to conduct criterion power analysis for linear multiple regression with an effect size of 0.15, a power

of 0.95, a total population size of 30, and two tested predictors, the necessary sample size for this study was 27.

Probability sampling was appropriate to use in this study. According to Frankfort-Nachmias and Nachmias (2008), probability sampling provides opportunities to target a specific group for data collection. I used a convenience sample because of the small size of the target population of parents of middle school children with ASD at the selected middle school. All parents who met the inclusion criteria in the study middle school received invitations to participate in the study.

Appropriateness of Sampling Plan

Although the study site middle school was a convenience sample, I invited all parents of students with ASD at the school to participate in the study. This type of sample was inferential to parents with middle school students with ASD. Although stronger than a convenience sample, this type of sampling is restricted to the scope of the data collected (see Creswell, 2015).

Alternative Sampling Plans Considered

I did not choose random sampling because of the study context, questions, and specific target group. Quota samples were inappropriate for similar reasons because it may have been challenging to find ethnic, gender, and age similarities among parents. I did not select probability sampling because I could not randomly select participants from a specific group of students with ASD because this would have limited the sample size. Because of the limited target population at the study site middle school, I invited parents

who met the inclusion criteria at the school to participate and complete the informed consent document and the survey.

Procedures for Recruitment

All parents whose children met the inclusion criteria were invited to participate in the study. After receiving permission from the school and from Walden University's Institutional Review Board (IRB) (09-09-20-0094170), I emailed all parents to invite them to participate in the survey research. The email included three items for parents: (a) an eligibility screener for parents to confirm that their children are in middle school and have received ASD diagnoses in binary format, (b) an item for parents to provide children's names and grades (to connect the scores to the survey data and informed consent), and (c) the IRB informed consent document. In the email, I introduced the study and myself as the researcher as well as informed the parents that their participation was completely voluntary. After the eligibility screener and informed consent documents were returned, the parents were sent a link for the data collection survey that included two items related to the study independent variables: (a) a categorical question about how much time participants spend reading with their children in an average week and (b) a categorical question on the number of books available at home. Demographics questions were also included on the survey. I collected data for the dependent variables from standardized testing and did not include them in the survey. After completing the survey, no follow-up procedures were required of the parents or their child.

I was provided with an email addresses and phone numbers for the parents in the target population from the school. If there was not a response to the recruitment email in

5 business days, I followed up by phone to invite the parent to participate in the survey. If the minimum sample size had not been reached after employing these tactics, I would have identified a second middle school using the STAR test to include in the study after returning to the IRB for a modification to the human subjects approval to account for the additional school.

Instrumentation and Operationalization of Constructs

The dependent variable in this study was reading performance as measured by change between tests of the STAR exam. The independent variables in this study were the time reading and number of age appropriate books in the home as measured by a survey of parents. The control variables in this study were age, education level, marital status, if the respondent was the mother or the father, and race of the respondents. The researcher-developed survey consisted of close-ended questions with a 5-point Likert scale analysis. The independent variables were captured through the parent survey, which I designed based on the literature presented in Chapter 2 and field tested.

Survey administration allowed me to gather scientific data about parents' self-reported PI levels. I used surveys to identify if a relationship exists between PI and growth in reading scores in middle school children with ASD. The researcher-developed survey instrument enabled measurement of the relationship between PI and the growth of reading achievement scores in middle school students with ASD. According to Creswell (2009), researchers use surveys to study a sample population and gain a numeric description of attitudes. An online survey was appropriate because it is more cost-efficient and faster than mail-in questionnaires (see Frankfort-Nachmias & Nachmias,

2008). The advantages of online surveying include rapid scanning of collected information and low to no administration costs (Frankfort-Nachmias & Nachmias, 2008). However, to account for technological access differences within the population, I would have provided participants with paper surveys as indicated necessary. The initial email to potential participants included my contact information and that a paper copy of the informed consent and/or survey could be mailed to the parent as needed.

STAR Reading Test Validity

Evidence of the validity of any educational assessment has several facets that, in aggregate, constitute empirical support for the use of the assessments for specific purposes and for the inferences that are to be made based on students' test scores. A crucial facet is the content of the tests; content-related evidence of validity lies in the degree of correspondence, or alignment, between the knowledge and skills measured by an assessment's test items and the knowledge and skills intended to be taught and learned in a given curriculum at a given grade level or levels (Renaissance Learning, Inc., 2013b) STAR Early Literacy Enterprise content aligns with curriculum standards at the state and national levels along with the STAR Reading Assessment. Renaissance Learning (2013) invited teachers to participate in a study to submit student scores from other assessments of reading, early literacy, readiness, and social skills, and scores were received for more than 2,400 students. The resulting correlation estimates were substantial and reflected well on the concurrent validity of STAR Early Literacy as a tool for assessing early literacy skills. After the original validity study, some additional studies, including both concurrent and predictive correlational studies, studies of classification accuracy, and

others, have been conducted (Renaissance Learning, 2013). The average correlations observed in these studies range from 0.52 to 0.77; correlations in that range are considered moderate to strong. Research support for the STAR Reading Assessment includes 76 research publications and 22 independent research publications. Renaissance Learning (2013b) collected a wide range of correlations between scores on STAR Reading and scores on other recognized, established measures of different aspects of reading achievement, such as survey achievement tests, diagnostic reading measures, and state accountability tests, among others. Table 1 summarizes the results of more than 400 concurrent and predictive validity studies conducted for STAR Reading, involving a total of more than 1 million students. The average correlations observed in these studies range from 0.60 to 0.87; correlations in that range are considered reliable. Below the table is a list of state assessments that have been found to correlate well with scores on STAR Reading (Renaissance Learning, Inc., 2013b).

Table 1

Summary of STAR Reading Validity Studies

	Predictive			Concurrent and other External Validity		
Grade	Studies	Students	Average Correlation	Studies	Students	Average Correlation
1	6	7,477	.68	15	1,135	.77
2	10	184,434	.78	32	4,142	.72
3	30	200,929	.80	44	4,051	.75
4	25	185.528	.82	41	5,409	.75
5	29	126,029	.82	40	3,588	.75
6	23	82,189	.82	37	2,728	.71
7	23	64,978	.81	33	3,294	.70
8	25	34,764	.81	29	2,148	.72
9	8	9,567	.83	15	949	.72
10	9	7,021	.85	11	566	.61
11	6	6,653	.86	6	324	.70
12	2	3,107	.86	4	165	.74

Data Analysis Plan

The data from both parent surveys and children's reading scores underwent analysis to determine if a relationship exists between PI with reading and the performance scores of students with ASD, controlling for demographic variables. To test the hypotheses, I used ordinary least squared regression. I used the Statistical Package for the Social Sciences (SPSS) Version 25 to analyze the data in order to address the question and associated hypotheses.

Specifically, I used multiple regression for analysis. I did not use the mixed methods approach because I did not combine quantitative data with qualitative data. According to Cohen (1968), there are multiple techniques for using multiple regression as a general variance-accounting procedure of high flexibility, power, and fidelity to

research aims in both manipulative and observational psychological research. For example, the identities of multiple regression and fixed-model analysis of variance/covariance emerge, which requires an exposition of means of expressing nominal scale data as independent variables in multiple regression. According to Sheposh (2018), scholars developed multiple regression in the early 20th century from the study of linear regression, the most basic form of predictive analysis. Multiple regression is a method used in statistical analysis to determine the value of a dependent variable based upon the value of two or more independent variables. Researchers use multiple regression to find the value that best calculates the searched-for data. These data can indicate the factors that result in an outcome or the forecast of an effect or trend.

Data Needed to Address Research Questions

The main purpose of this study was to determine whether a relationship exists between PI and the growth of reading achievement scores in middle school students with ASD. All students must read at their grade levels by the end of each school year based on the STAR Reading test. All students must take at least three STAR Reading tests that occur at the beginning, middle, and end of the school year. I compiled the data from the first test scores (August) and compare them with the other two reading scores (December and May) to see if PI had an impact on the reading scores of students with ASD. More specifically, I calculated the difference between the two scores to measure growth in reading.

Cleaning and Coding

After collecting the data, I cleaned and coded the data. In cleaning the data, I removed any responses that are not at least 50% complete and check the eligibility of all respondents to the inclusion criteria. In coding the data, I entered it into an Excel spreadsheet to create a single dataset from my two data sources. In this step, I matched STAR scores to parental scores to form one row of data for each parent-child dyad in the data set. After all data have been paired and entered, no identifiers remained in the data set. Missing data were coded as 999, which was recorded in SPSS as a missing value.

Assumptions Testing

Before conducting the regression analysis, I used SPSS to test the assumptions of regression. More specifically, I assessed the data for normal distribution, multicollinearity, non-homogeneity, linearity, and autocorrelation (Daoud, 2017). If I found that the assumptions are not met or that she had violated the assumptions, it was proposed that I would then use a nonparametric alternatives.

Regression Analysis

Analysis was conducted to address the guiding research question and associated hypotheses. To interpret the statistical output, I used an alpha level of 0.05 for significance of models and independent variables. In SPSS, multiple linear regression was conducted using the data from Time 1 and Time 3 of the STAR Reading scores as the dependent variable. For this model, there were two independent variables: number of books available and time spent reading. Age, race, education level, marital status, and parent completing the survey were included as control variables.

Ethical Procedure

My role as the researcher of this study was to send out and collect survey responses using both a paper survey and SurveyMonkey. Parents received an eligibility screener survey and an informed consent document before they received a link to the survey to ensure that they met the study's inclusion criteria. Parents who consented and met the inclusion criteria received a link to the online survey. The confidential data were anonymized after collection to protect the identify of participants. All interactions with parents as human subjects were approved by the IRB before collecting data. I stored data from the online survey on a password-protected computer that only I could access, with data from the eligibility screener kept in a locked file cabinet with the informed consent documents. Once I collected all responses, I sent the survey results to a middle school administrator at the case school with the name of the child. The administrator paired the survey results with the student's STAR reading scores for all three testing dates. The scores were entered into the Excel file datasheet and all identifying information was removed from the file. The administrator then returned the anonymized data to me for analysis.

Summary

I used the results of the study to determine if a relationship exists between PI and growth in the reading achievement scores of middle school students with ASD. The findings of this study contribute to research on whether a relationship exists between PI levels and children's reading scores. Parents must get involved and spend time reading with their children to increase their students' reading levels. Current data show a

significant connection between the attitude of parents toward reading with their elementary-level children. I analyzed the data to ascertain if a relationship exists between PI and the reading achievement scores of middle school students with ASD. Darling and Westberg (2004) established a relationship between parents who read to students in kindergarten through third grade and students' improved reading proficiency. As outlined in this chapter, I sought to understand a similar relationship for middle school students with ASD. (The results of the procedures presented in this chapter are detailed in Chapter 4.

Chapter 4: Results

The purpose of this study was to determine whether a relationship exists between PI and the growth of reading achievement scores in middle school students with ASD. The study explored what connection or impact PI had on whether a child's reading scores improved when parents were more involved. The research question guiding this study was: To what extent do the time parents read to their child and the number of books available at home predict the reading scores for middle school children with ASD? I hypothesized that the time parents read to their child and the number of books available at home would predict the reading scores for middle school children with ASD.

I invited parents with a middle school student at the study site middle school who met the autism criteria to participate and complete a survey. Parents were sent an email invitation with a link to complete the survey that included the consent form (see Appendix). Out of 30 students with an identifiable diagnosis of autism, 27 parents completed the survey. The three who did not take part in the study either declined to participate or had moved at the beginning of 2019–2020 school year.

Data Collection

Time Frame, Actual Recruitment, and Response Rates

I initially sent parents an email with an invitation to participate in the study based on meeting the autism criteria on September 9, 2020. Within the letter were instruction to click on the provided link, which would then take them to SurveyMonkey. Once parents clicked on the link, a consent form describing what the study entailed was found on the first page on the SurveyMonkey site. Once a parent agreed to participate, they were then

taken to the survey. If a parent decided after reading the consent form to opt out of the survey, the option to leave the page was offered. The average time it took for parents to complete the survey was roughly 5 minutes. After 1 week, I followed up with any parents who had received the original email invite through a phone call. Out of the 30 parents invited to participate, only 27 agreed with three stating they declined due to having moved at the beginning of the 2019–2020 school year. Overall, the entire data collection took 2 weeks to conduct, with 90% of the parents invited completing within 1 to 2 days of initial contact with email.

Descriptive Statistics for Demographic Characteristics

Table 2 shows descriptive statistics for the 27 parents who participated in the survey. The majority (85%) of respondents who completed the survey were mothers of middle school students with autism. The majority (63%) of the respondents lived with a single parent partner, while 37% of respondents lived with a partner or spouse. Most participants who responded to the survey had some type of college education (87.9%). Less than half of those completing had some or little education to include high school and beyond. About three-quarters (74.1%) of the parents responding were Anglo/White with the remainder of Black American, Mexican American, Asian American, and American Indian. This aligns with the target population, of which about 80% are Anglo/White.

Table 2

Respondent Demographics

		n	%
Person completing survey	Mother	23	85.2%
	Father	3	11.1%
	Other	1	3.70%
Marital status	Partner or spouse living at home	17	63.0%
	Single parent (not married, separated, divorced, widowed, etc.)	10	37.0%
Education	Some high school	1	3.70%
	High school/GED	3	11.1%
	Some college	10	37.0%
	College	7	26.0%
	Some graduate education	2	7.40%
	Graduate degree	4	14.80%
Ethnicity	Anglo/White	20	74.1%
	Black American	3	11.1%
	Mexican American or Hispanic	5	18.5%
	Asian American	1	3.70%
	American Indian	2	7.40%

Note. $N = 27$.

Data from the survey show that parents reporting that their child reads at home, they do so between 1 to 6 days with the average being 7.6 days, but 11.1% of parents reported that their children do not read at home. Only one parent reported their child reads daily (see Table 3).

Table 3

Read at Home

	n	%
Never	3	11.1%
1 or 2 days	7	25.9%
3 or 4 days	10	37.0%
5 or 6 days	6	22.2%
Every day	1	3.7%

Almost half (44.4%) of the parents who read with their child do so at least once a week, with only two (7.4%) reading 3 or more days a week. Of all the parents who completed the survey, nine (33.3%) do not read with their child at all (see Table 4). For further statistical analysis of this independent variable, these categories were coded as does not read with child = 0, 1 day = 1, 2 days = 2, 3 days = 3, and 3 or more days = 4.

Table 4

Read With Child

	n	%
Does not read with child	9	33.3%
1 day	12	44.4%
2 days	4	14.8%
3 or more days	2	7.4%

There was variation in the number of books parents have within the home and number of these books that are for their children. Overall, parents have a wide range of books in the home, from zero books to 300. Similarly, there is a wide range of number of books for their child, from zero to 200. Parents reported an average of 129.1 books in the home (*SD* = 93.4) and an average of 52.2 (*SD* = 44.2). In the inferential statistics, age appropriate books at home was included as an independent variable.

Table 5

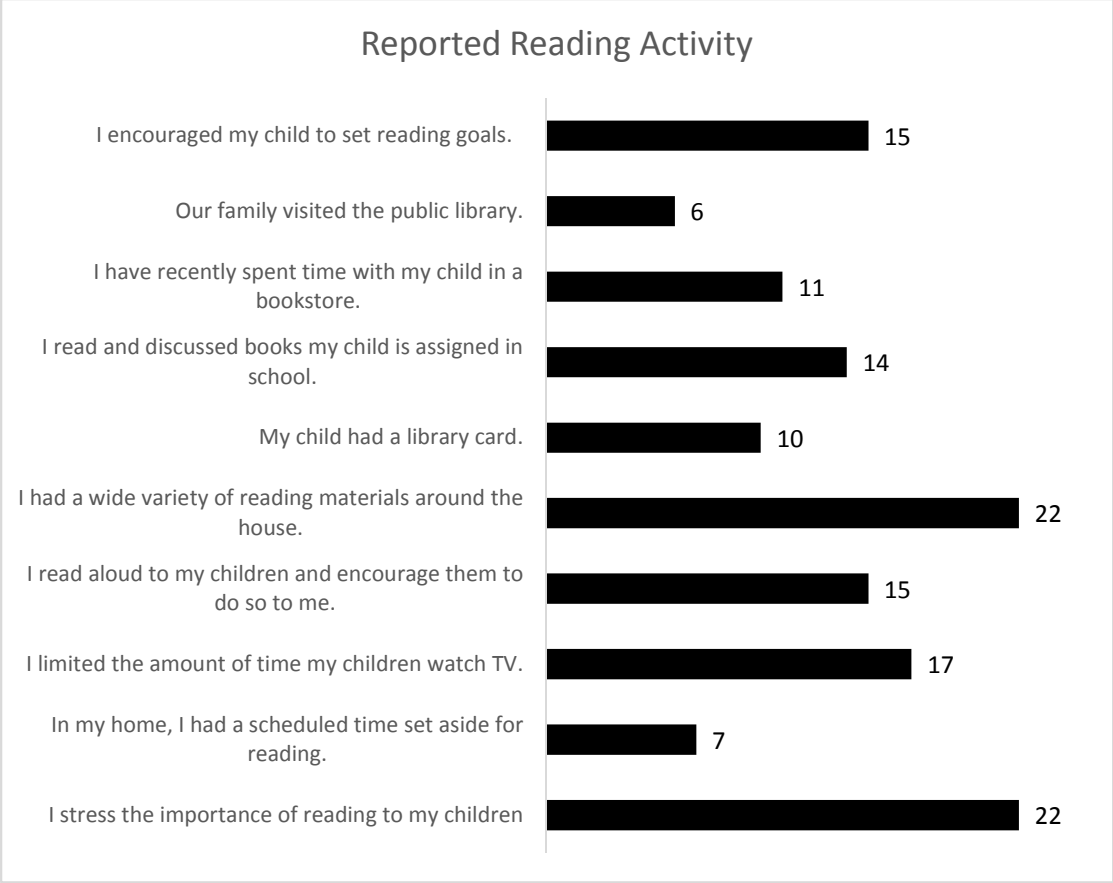
Books in the Home

Variable	Min	Max	*M*	*SD*
Books at home	0	300	129.1	93.4
Age appropriate books at home	0	200	52.2	41.2

Figure 1 shows frequencies for behaviors related to reading in Fall 2019. A majority (81.5%) of parents stressed the importance of reading to their child along with providing plenty of reading material for children to read. Even though parents thought reading was important, only six (22.2%) went to the library to check out books to read. A little over half of the parents (51.1%) did read to their child and 55.6% of the parents encouraged their child to set reading goals at home. Sixty-three percent of the parents stated they put a limit on the amount of television children could watch and 25.9% had a scheduled time specific for reading.

Figure 1

Reported Reading Activity in Fall 2019



Descriptive statistics for the dependent variable, independent, and control variables, and STAR reading scores are presented in Table 4. The DV was the difference between Assessment 1 and Assessment 3 for STAR Reading scores. Time spent reading with child and age appropriate books at home were measures of PI and included as the independent variables. I included mother, married, and Anglo/White as binary control variables as well as age and education as continuous control variables.

Table 6

STAR Reading Scores

	Minimum	Maximum	*M*	*SD*
Time 1 score	0.0	10.0	4.5	2.6
Time 3 score	1.7	10.0	6.1	2.5
DV (Time 3-Time 1)	-0.4	4.4	1.59	1.3
Time spent reading with child	0	3	.96	.90
Age appropriate books at home	0	200	52.22	44.2
Mother	0	1	.85	.36
Married	0	1	.63	.49
Education	1	6	3.6	1.2
Anglo/White	0	1	0.7	.45
Age	32	52	39.33	5.1

Results

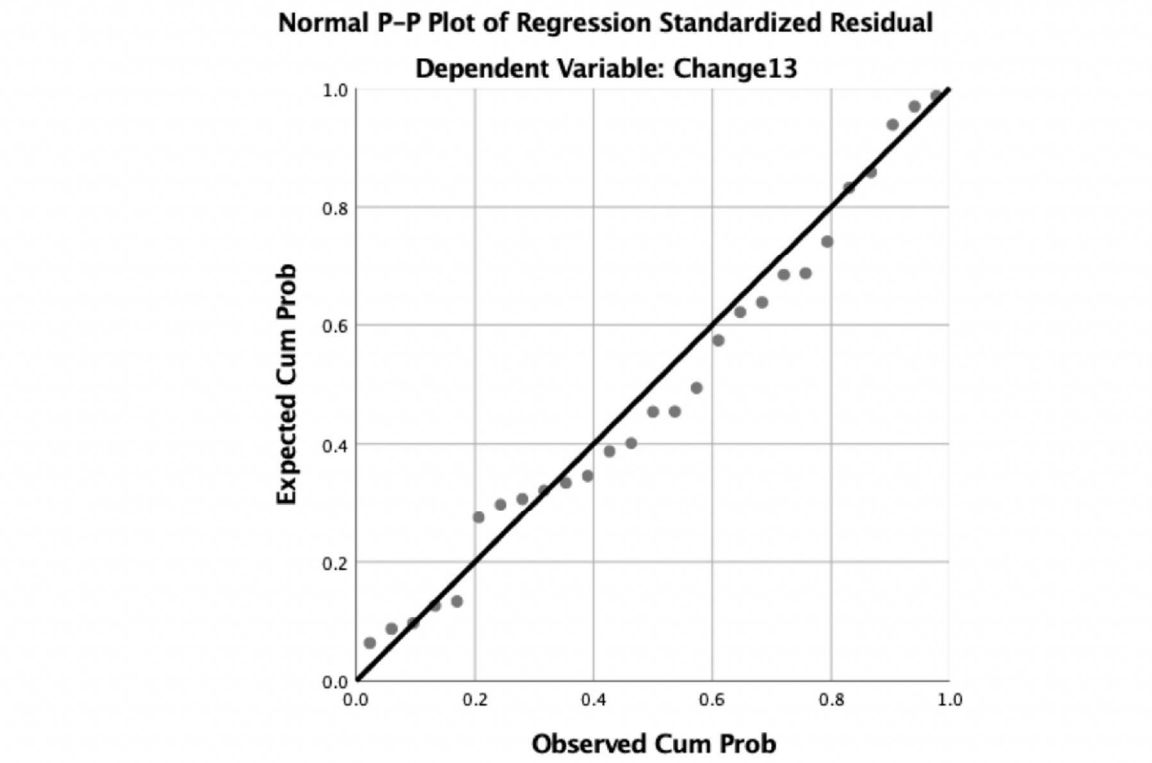
To address the research question, I examined whether there was a significant relationship between PI and reading achievement scores in middle school students with autism when controlling for demographic variables. The results related to the DV, measured as Time 3 STAR scores minus Time 1 STAR scores, met the assumption of normal distribution based on a Shapiro-Wilkes significance of .232.

Concerning the DV, I found no significant correlations or correlation coefficients over .70 between the predictor variables, so these data met the assumption of multicollinearity. However, I did not find that the DV was correlated with either

independent variable at the .30 or higher level of correlation. The normal P-P plot reveals that the regression residuals generally follow the line (see Figure 2).

Figure 2

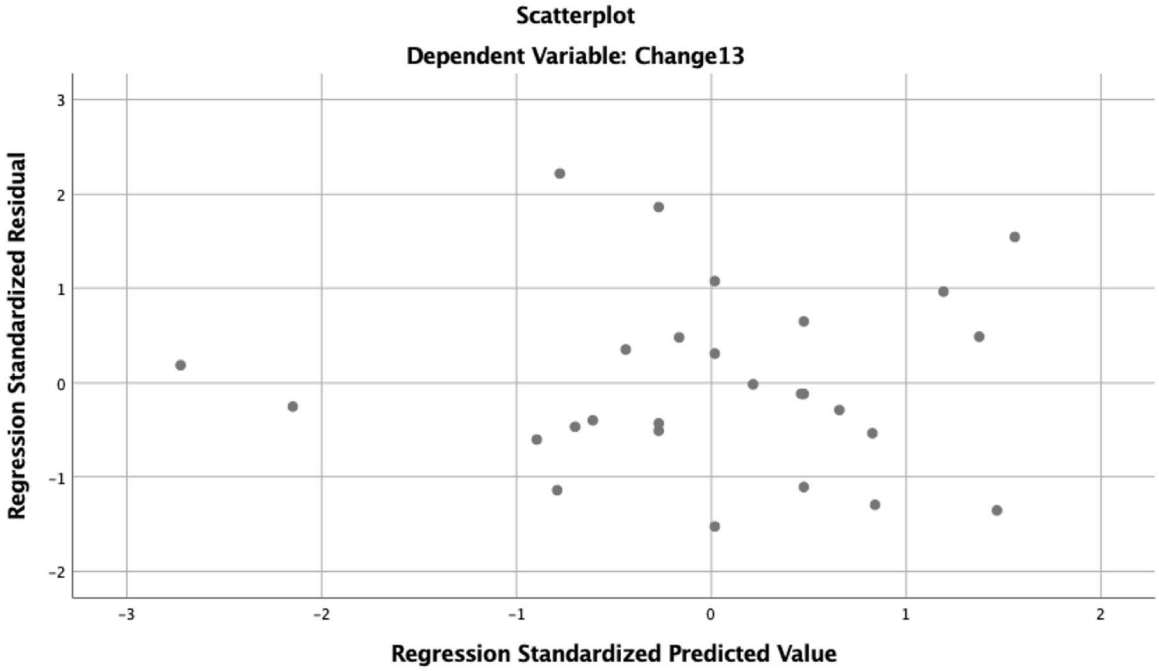
Normal P-P Plot Results



Next, it can be seen in the regression standardized residual value on the y-axis and that the standardized residual value on the x-axis that the data meet the assumption of multicollinearity; none of the values are less than -3 or greater than 3 (see Figure 3). The standard residual minimum of -1.53 and maximum of 2.22 falls within the acceptable range of -3 to 3. The maximum Cook's Distance is .748, which is below 1, making it acceptable.

Figure 3

Regression Assumption Plot of Residual and Predicted Values



Finally, the ability of number of books and reading with child to predict DV was assessed using zero-order correlation (see Table 7) and OLS regression (see Table 8). Two of the correlations are significant at the 0.05 level: mother and education (r=-.579) and mother Anglo/White (r = -.492). However, there were no statistically significant correlations between the dependent or independent variables. The model is statistically significant, $F(7,19) = 2.692$, $p = .041$. The R^2 of .498 indicates that the predictor and control variables in this model explain 49.8% of the variation in change in the reading score. However, review of the significance of the variables reveals that only age is a statistically significant predictor of the DV (p<.05). As age is a control variable, I fail to reject the null hypothesis that time parents read to their child, and the number of books

available at home, will not predict the reading scores for middle school children with ASD, controlling for demographic variables.

Table 7

Zero-Order Inter-Correlations Among Variables (N=27)

	1	2	3	4	5	6	7	8
Mother	-	.112	-.579**	-.009	-.492**	-.089	.337	.131
Married		-	-.069	-.104	.189	.166	-.206	.043
Education			-	-.131	.289	.037	-.261	.061
Anglo/White				-	-.264	.282	.167	.233
Age					-	-.366	-.240	-.105
DV						-	-.262	-.166
Time							-	-.080
Books								-

**Correlation is significant at the .01 level

Table 8

OLS Regression for Change in STAR Scores between Time 1 and Time 3 (N=26)

	Model		
Independent Variables	*b*	*se*(*b*)	*B*
Time spent reading with child	-.714	.402	-.328
Age appropriate books at home	-.012	.007	-.310
Mother	-1.119	1.329	-.207
Married	1.109	.700	.279
Education	.119	.334	.074
Anglo/White	1.286	.805	.293
Age	-.221	.078	-.575*
R^2	.498		
F ($p < .05$)	.041		

*Statistically significant at the .05 level

Summary

In data analyses, I assessed to what extent a relationship existed between parental involvement and reading achievement scores in middle school students with autism.

Though the data did show parents are involved, with their child when asked questions about their reading habits, there was not a statistically significant increase in the reading scores of all the students. The ability of number of books and reading with child to predict DV controlling for demographic variables was assessed using OLS regression; the results indicated that the model was statistically significant, but neither independent variable was statistically significant.

In Chapter 5, a conclusive summary of the current study is provided, including an analysis and interpretation of the findings, a comparison of the limitations presented in Chapter 1 to the post study limitations, recommendations for future research, and a discussion that focuses on how the results of this study could have implications for the positive social change with parents with middle school students with autism.

Chapter 5: Interpretations, Recommendations, and Conclusion

The purpose of this study was to examine the relationship between PI and reading achievement scores in middle school students with autism. In this study, I examined the impact of PI, measured as age appropriate books in the home and time spent reading with a child, on change in reading scores between August 2019 and May 2020. Thorndike's stimulus-response theory on the transfer of learning was used as the theoretical framework in this study to show how it applied to students with ASD and their reading responses to parental stimuli triggers. In the study, the stimulus was PI, and the response was increased reading scores.

Reading proficiency is determined by if a student is reading at or above grade level (NCES, 2013). According to Benner et al. (2016), student success is linked to parental educational involvement in primary and secondary school; however, less is known about the long-term effects of PI. Although the results of the regression model were statistically significant in the current study, I did not find any significant relationship between the number of books in the home and reading achievement scores in middle school students with autism.

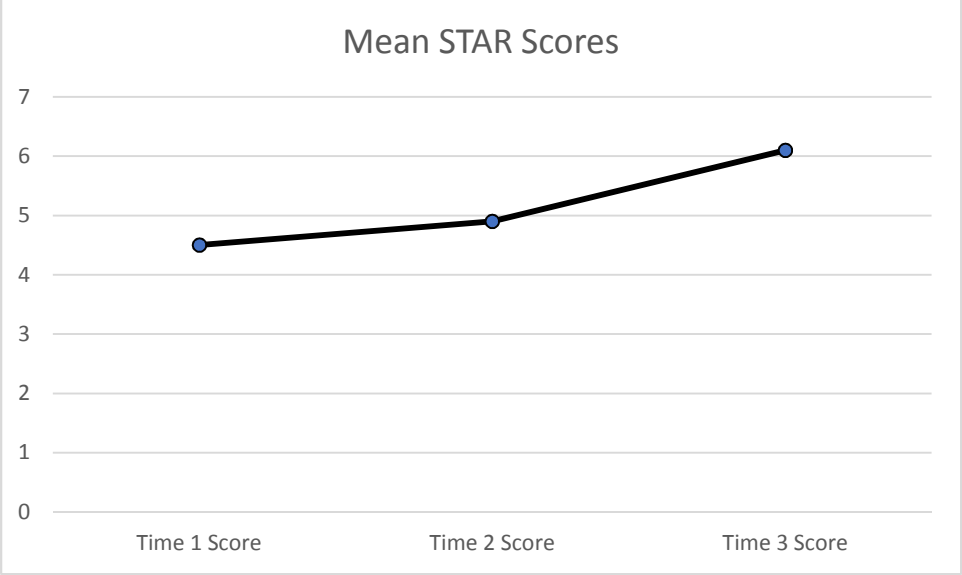
Interpretation of the Findings

In this study, I found that PI is not a significant predictor of reading achievement for middle school students with autism. Although PI was not found to be a significant predictor of reading achievement in middle school students with autism, this finding does not align with the research that connects these variables. For instance, Baharudin et al. (2010), Epstein et al. (2009), Herrell (2011), and Pattanaik and Sriram (2010) all

concluded that PI is, in fact, an essential indicator of students' academic success. Khajehpour and Ghazvini (2011) determined that when parents were more involved with their children's education, their children had better grades. Even though the results of the current study showed that parents are involved and that STAR scores increased across the three times that reading achievement was assessed (see Figure 4), I did not find a connection between reading achievement scores and PI when focusing more specifically on middle school students with autism.

Figure 4

Mean STAR Scores



In the survey, I asked parents questions about reading with possible answers like "I stress the important of reading to my children" and "In my home, I had a scheduled time set aside for reading." The results indicate that 18.5% and 74.1% of parents, respectively, are involved in these areas; even though the percentages were considered high for the setting aside time to read, the results did not support the research question

about PI and reading achievement scores. Previous research has shown that when parents read to their children, there was an increase in the children's reading scores (Hawes & Plourde, 2005). In this study, I found that scores increased and that parents are involved, albeit to different levels, but did not find a relationship between these factors. The amount of parental support a student received at home is presented in the literature as a predictor of their levels of growth and academic achievement in school (Christian et al., 1998; Committee on Early Childhood Pedagogy, 2000; Jeslas et al., 2016). Jeslas et al., for instance, stated that a positive correlation does exist between PI, responsive parenting practices, and stimulating reading achievement reading scores. The results of the present study, however, contradict these findings.

I found that age, a control variable in the model, was significant; more specifically, for every 1-year increase in the respondent's age, there was a 0.5 point less change between the Time 1 and Time 3 STAR reading scores. In other words, although PI was not found to be significant, as the parent's age increased, there was less gain between the two scores. This finding aligns with the extant research stating that younger parents tend to have a higher interest in reading to their children by developing a parent-child relationship that helped increase reading achievement (Chansa-Kabali & Westerholm, 2014).

The theoretical foundation for this study was Thorndike's (1932) stimulus-response theory on the transfer of learning, which is based in the tenets of: (a) law of effect: responses to a situation (e.g., parent reading to student), followed by a reward to strengthen; (b) law of readiness: a series of responses can connect to satisfy a goal; and

(c) law of exercise: connections strengthen with practice. Although I failed to reject the null hypothesis in this study related to the impact of PI on reading achievement for middle school students with autism, the study has contributed to the research of this phenomenon through the lens of stimulus-response theory in the findings that perhaps PI is not a stimulus to reading achievement for this population.

Limitations of the Study

There were significant limitations to this study. First, the quantitative design presented a limitation because with its use, I did not seek to discuss the context of the relationship, only to assess if it existed. I did not find a significant relationship to support the hypothesis. A second limitation was that in using the stimulus-response theory, this study only considered PI as the stimulus and reading achievement as the response. The research did not include the assumption that parents would provide other forms of support that may have impacted STAR scores. Not all parents surveyed stated they had books in the home or spent time reading with their child at all. Another major limitation involved the population pool that I drew participants from. With the school located in a small, rural area, the number of students who met the criteria for autism was 30, of which 27 parents completed the survey. The small number of students attending the middle school prevented me from inviting a larger pool of parents to participate, which may have impacted the results. My role as the researcher and as a teacher in the study site school presented possible researcher biases, which was also a limitation. However, I had no influence over the dependent or independent variables in this study. Some parents may have been hesitant to complete the survey with the knowledge that I am both the

researcher and the teacher. Finally, I made the assumption that the parents would be honest with their individual responses while completing the survey about the number of books in the home. As reading is positive behavior, it is possible that parents overreported the number of books in their home or time spent reading with their child.

Recommendations

In this study, I addressed a research question about whether a relationship exists between PI and reading scores. Although the findings did not support the hypothesis that PI had an impact on reading achievement scores, they do show a need for future studies involving a larger pool of participants. The study can be replicated but should include more schools to get a larger sample size. The current study involved only 27 of 30 parents with students who met the autism criteria. Because age was significant in the regression model, future research is recommended to better understand the relationship between parents' age, PI, and reading achievement. To get a better understanding of what impact PI has on reading achievement scores, surveying parents from surrounding schools would provide insight along with possibly conducting follow-up cognitive interviews to get more specific information on their survey answers.

Implications

The implications of the study findings are that it is perhaps a factor other than PI that has caused the change in the students' STAR scores. For example, studies have shown the home environment provides an essential context for academic support (Taylor et al., 2017). However, educators and clinicians can use aspects of a child's behavioral or psychological functions for reading comprehension to create a separate risk aspect index

that may complement or interact with the home environment risk (Taylor et al., 2017). Furthermore, Spence (1950) argued that learning and motivation factors influence behavior, more precisely, habit strength and drive influence behavior. Individual differences in temperament (i.e., influences thoughts, emotions, and behaviors) may indicate academic achievement (Taylor et al., 2017). Besides, when imagining an academically impoverished home environment, it is easy to focus on SES as a significant contributing factor because SES indicates academic achievement and literacy. Children from more impoverished families tend to have lower achievement contexts for reading achievement, which includes more than classrooms and teachers (Taylor & Hart, 2014). Lower achievement contexts also incorporate the child's temperament, behavioral characteristics, and means of interaction with the environment (Taylor & Hart, 2014).

Even though the regression model from the study did not show any significance to PI, the findings did contribute to the literature in factors that affect reading for ASD students in middle school. Reading is an area of concern across the United States. The National Education Association's (2008) Task Force indicated that educators foster reading achievement through differentiated instruction using ratios that are not always equal. State assessments show that more students read below their grade levels compared to students in 1998. Most of the research conducted thus far primarily shows that regular education children do not meet adequate yearly progress indicators. Relatively few studies show effective practices for struggling readers or special needs students (Brownell et al., 1993). Good readers come from psychologically comfortable home

environments and caregivers who foster positive attitudes toward reading and learning as well as provide stimulating cultural and language experiences (Beatson, 2000).

Conclusion

According to Keen et al. (2016), there has been very little attention from research on the academic achievement of individuals with ASD, despite the importance placed on this by schools, families, and students with ASD. In this study, I examined the relationship between PI and reading achievement scores in middle school students with autism. Researchers have suggested that it is vital to encourage parents to support reading and get involved with their children's education as well as that parents are the first teachers before children enter the school system (Szabo, 2019). However, I did not find PI to be a statistically significant predictor of reading achievement in this study, but the parent's age was found to be a significant predictor. Yet, it is well established in the extant literature that the home environment is essential to children's academic success because it provides children with a permanent environment and point of reference; therefore, PI is critical (Szabo, 2019). Further research is needed to better understand the relationship between PI and reading achievement scores in middle school students with autism and other ways to support this population.

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Appendix: Survey Questionnaire

1. What is your child's first and last name? _____

2. Who is filling out this questionnaire?

    o Mother

    o Father

    o Guardian

    o Other (please specify): _____

3. What is your age in years? _____

4. Marital Status

    o Single parent (not married, separated, divorced, widowed, etc.)

    o Partner or spouse living at home.

5. What is the highest level of education you have completed? (Please check only one.)

    o elementary school

    o some high school

    o high school/ GED

    o some college

    o some graduate education

    o graduate degree

6. Which is your ethnicity? (Please check all that apply.)

    o Anglo/Caucasian

    o. Black

    o. Mexican American or Hispanic

o. Asian

o. American Indian

To answer questions 7-11, please think back to Fall 2019.

7. In the typical week, how many days a week did your child read at home?

o Never

o 1 or 2 days

o 3 or 4 days

o 5 or 6 days

o Every day

8. In the typical week, how many days a week did you read with your child at home?

o Never

o 1 or 2 days

o 3 or 4 days

o 5 or 6 days

o Every day

9. How many books were in your home library?

10. Of these books, how many were for your middle schooler?

11. Please check all of the following that apply to you:

_____ I stressed the importance of reading to my children.

_____ In my home, I had a scheduled time set aside for reading.

_____ I limited the amount of time my children watch TV.

_____ I read aloud to my children and encourage them to do so to me.

_____ I had a wide variety of reading materials around the house.

_____ My child had a library card.

_____ Our family visited the public library.

_____ I read and discussed books my child is assigned in school.

_____ I encouraged my child to set reading goals.

_____ I liked to read.