Examining the Impact of Early Reading Achievement, Individual, and School Characteristics on Later Outcomes of Students with Intellectual Disability

By

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DEDICATION

I dedicate this dissertation to Cemal Afacan, Sevinç Afacan,

and Dr. Kimber L. Wilkerson.

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ABSTRACT

During the last decade, an increasing number of students with intellectual disability (ID) have taken statewide general reading assessments. Also, all states have designed and implemented alternate reading assessments for students with significant ID who could not participate in general assessments. To date, few studies have examined the reading outcomes of students with ID on those assessments and none of these studies have examined whether outcomes from statewide assessments have predictive value for students' later school outcomes. The purpose of this study was to examine the relationship between students with ID's 5th grade reading performance as measured by statewide standardized assessments and their later academic and behavior outcomes, including 8th grade reading, as measured by the statewide standardized assessment, and the following secondary school outcomes: (a) school attendance, (b) credits earned in one semester, (c) office discipline referrals, and (d) suspensions received. This study also aimed to examine whether students' ethnicity/race and the type of school attended in middle and high school had an impact on their academic and behavior outcomes. A longitudinal dataset including a sample of 400 students with ID attending schools in a Midwestern school district was used to answer this study's research questions. Regression tests were run to examine whether (a) 5th grade reading performance, (b) ethnicity/race, and (c) type of middle and high school attended significantly predicted the students' middle and high school outcomes. Regression tests revealed significant and non-significant results. Students with ID's 5th grade reading achievement significantly predicted their 8th grade reading achievement in the alternate assessment. Also, students' 5th grade reading achievement significantly predicted their secondary ODRs and suspensions received. In terms of ethnicity/race, White students with ID had significantly higher secondary attendance days and received significantly less secondary

suspensions compared to their non-White counterparts. Finally, students with ID attending innovative schools received significantly higher secondary ODRs compared to their counterparts attending traditional schools. Implications of these results were discussed. Recommendations for future research were provided.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

FIGURE PAGE

CHAPTER 1

RATIONALE AND PURPOSE

Introduction to the Problem

Reading has been defined as an essential skill that allows students, regardless of abilities, to navigate their future progress and success in every phase of life (Kliewer & Landis, 1999). Being able to read increases students' chances of independent living, employment, and postsecondary education (Barton, 2000; Conners, 2003). Researchers have found that students' early reading skills significantly predict their later outcomes. For example, higher levels of reading during the elementary grades significantly and positively predicted students' high school reading achievement (Adelson, Dickinson, & Cunningham, 2016; Cunningham & Stanovich, 1997). On the other hand, having a lower level of reading was a significant predictor of grade retention (Balfanz, Herzog, & Iver, 2007) as well as juvenile delinquency and recidivism (Harris, Baltodano, Artiles, & Rutherford, 2006; Katsiyannis, Ryan, Zhang, & Spann, 2008).

Reading constitutes the largest area of research among academic interventions conducted in the field of special education (Mastropieri et al., 2009). A great focus on reading for students with disabilities is due to their less developed reading skills as compared to their counterparts without disabilities. According to the National Assessment of Educational Progress Report (NAEP, 2013), only 9% of students with disabilities were at proficient or above levels in eighth grade reading as compared to 40% of students without disabilities. This substantial gap in reading achievement makes it clear why reading has received considerable attention by special education researchers.

Although students with disabilities are at risk for low reading achievement in general, past studies have suggested that some students with disabilities experience this risk more than

others. Compared to their counterparts receiving special education services under other disability categories, students with intellectual disability (ID) have the lowest reading outcomes (Gronna, Jenkins, & Chin-Chance, 1998; Wei, Blackorby, & Schiller, 2011). Several studies have documented low reading achievement of students with ID. For example, Katims (2001) reported that only one in five students with ID achieved even minimal reading skills as measured by an informal reading inventory, particularly in the areas of contextualized word recognition, narrative reading comprehension, and phonemic awareness. A study examining students with disabilities' statewide reading assessment results in the state of Florida found that only 3% of students with ID performed at or above the proficient level in reading in fourth and fifth grades (Trexler, 2013). Similarly, researchers examaining statewide reading exams in Minnesota found that only 1% of eighth grade students with mild to moderate ID and none of the students with moderate to severe ID had reading skills that helped them to perform at or above the proficient reading level (Thompson, Thurlow, Spicuzza, & Parson, 1999).

During the last decade, these negative reading outcomes have laid the foundation for a drastic shift in the way that reading instruction has been conceptualized for students with ID. Until recently, these students have been taught with a functional reading approach that has exclusively focused on sight word reading (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006). In this type of instruction, the students' reading skills were limited to "being able to identify text found in everyday life (e.g., menu items, restroom signs, job tasks)" (Browder et al., 2009, p. 272). However, this type of instruction has not allowed students to master reading skills necessary for accessing broader, richer, and grade level reading instruction (Copeland & Keefe, 2007).

The inadequacy of the sight word reading in improving the reading skills of students with ID has resulted in the development of more effective, longitudinal, and multicomponent programs (e.g., Allor, Mathes, Roberts, Cheatham, & Champlin, 2010; Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, 2008). These programs involve the use of multiple components of reading in reading instruction as suggested by the National Reading Panel (NRP; 2000) and aim to help students with ID develop effective early reading skills. These components include teaching phonemic awareness, phonics, vocabulary, fluency, and comprehension skills via evidence-based strategies such as time delay and direct instruction. Recently, researchers have concluded that many students with ID were capable of developing effective reading skills through longitudinal and multicomponent programs as compared to their counterparts receiving instruction via a functional curriculum (Afacan, Wilkerson, & Ruppar, 2017; Allor, Mathes, Roberts, Cheatham, & Al Otaiba, 2014; Browder, Ahlgrim-Delzell, Flowers, & Baker, 2012).

These recent developments in reading instruction programs for students with ID can be attributed, at least in part, to provisions in federal legislation. For example, the reauthorization of the Individuals with Disabilities Education Improvement Act (IDEA; 2004) and the Every Student Succeeds Act (ESSA, 2015), which is the reauthorization of No Child Left Behind (NCLB, 2002), hold schools accountable for reporting improved outcomes for all students, including students with ID, in the content area of reading. Students with ID are included in the school accountability systems via district or statewide assessments: “All children with disabilities are included in all general state and district-wide assessment programs… with appropriate accommodations and alternate assessments where necessary and as indicated in their respective individualized education programs” [612(a)(16)(A) of IDEA]. Several states have been using district or statewide assessment results as one of multiple criteria for high school

graduation (e.g., Florida, Washington, Minnesota) and for advancing students between grade levels (e.g., Wisconsin). In Wisconsin, this assessment is the Wisconsin Knowledge and Concept Examination (WKCE).

The reading portion of the WKCE includes authentic text reading passages and thematically linked questions to measure students' ability to determine the meaning of words and phrases in context and understand, analyze, evaluate, and extend text (Wisconsin Department of Public Instruction [WDPI], 2014). The test requires students to demonstrate critical and creative thinking, problem solving, and skills that are necessary to make meaning of reading text. It is administered in grades 3 through 8 and once in high school. The state uses four reading proficiency levels to interpret students' scores on the reading test: Minimal, basic, proficient, and advanced performance.

The state of Wisconsin also offers the Wisconsin Alternate Assessment (WAA) for students who cannot participate in general assessments due to significant challenges related to intellectual functioning, adaptive behavior, and academic functioning. The individualized education program (IEP) teams determine who will take the alternate assessment. The ESSA includes a requirement that a maximum of 10% of students with disabilities can be tested via alternate assessments. Depending on the students' needs, a variety of accommodations can be offered to them such as translation, signed test questions and content, Braille, assistive devices, and objects or manipulates (WDPI, 2015). In Wisconsin, students with ID comprised the highest percentage of all students taking the WAA (WDPI, 2015). This is consistent with national statistics suggesting that students with ID represent the largest group of students taking alternate assessments (Cameto et al., 2009). Like the WKCE, this test is also administered in grades 3 through 8 and once in high school. Also as with the WKCE, the state uses four reading

proficiency levels to interpret the students' scores on the WAA reading test: Minimal, basic, proficient, and advanced performance.

As noted above, early reading skill has been a significant predictor of later reading success for students in general. For students with ID, existing reading instructional approaches have been changing from focusing on functional curriculum to focusing more on the general education content. This change to more rigorous instruction hopefully lays the groundworks for researchers and educators to observe more growth in existing comprehensive and longitudinal reading performance evaluations. Additionally, increased accountability in public education has simultaneously placed a strong emphasis on increasing expectations as well as the quality of reading instruction for students with ID (e.g., more emphasis on evidence-based practices). Obviously, we are in a new era of research in reading for students with ID. There is a high demand on researchers' and educators' shoulders to make sure that students with ID are well prepared for statewide general or alternate reading assessments. However, very little attention has been given to the results of these assessments and whether they have any correlation with later academic and behavior outcomes for students with ID. Specifically, why are statewide reading assessments important for students with ID? An examination of whether students with IDs' early reading performances on the statewide assessments have a predictive value on their later achievement is an area for further exploration. This study examines students with IDs' 5th grade reading results from general and alternate assessments to study whether these results have any association with 8th grade reading results, secondary attendance, credits earned, office discipline referrals (ODRs), and numbers of suspensions experienced in secondary school.

The Impact of Ethnicity/Race and School Placement

In addition to early reading success, it is also important to take students' ethnicity/race into account in the analysis of academic and behavior outcomes. Researchers have commonly reported achievement gap in reading between White and Black students. To illustrate, Adelson et al. (2016) examined students' reading scores in Kentucky and found that Black students had significantly lower reading achievement compared to White students. Using a national database of 3,975 students, Hernandez (2011) indicated that 16% of Black and 17% of Hispanic students read at the proficient level in fourth grade as compared with 42% of White students. Lesnick, George, Smithgall, and Gwynne (2010) examined school outcomes of 26,000 Chicago Public Schools students and reported that 44% of Black students and 33% of Hispanic students read at below grade level compared to 18% of White students. Past research has also suggested divergent outcomes for school attendance and discipline by ethnicity/race. For instance, Ginsburg, Jordan, and Chang (2014) found that Native-American, Black, and Hispanic students had higher rates of poor attendance compared to White students. Additionally, Black students were more likely to receive exclusionary discipline actions compared to their White counterparts (Bal, Betters-Bubon, & Fish, 2017; Losen & Gillespie, 2012; Skiba, Michael, Nardo, & Peterson, 2002). Given that school outcomes may vary by ethnicity/race, it is important to examine the impact of students' ethnicity/race on their academic and behavior outcomes. Yet, an examination of students with ID's academic and behavior outcomes by ethnicity/race is still rare.

School placement is another important variable that may have an impact on students' academic and behavior outcomes. Over the last two decades, growing attention and emphasis have been given to ensuring that students with disabilities have access to general education content, as well as inclusive practices, in traditional neighborhood schools. Historically, a majority of students with ID were predominantly educated in non-traditional education settings

such as special schools, self-contained classrooms, or resource rooms (McDonnell & Hunt, 2014). Recent statistics confirms that this historical trend still exists today with only 17% of all students with ID nationwide educated in regular classrooms, 80% or more of a day, along with their peers without disabilities (U.S. Department of Education, 2015). Moreover, a substantial percentage of students with ID have been educated in alternative education settings (Kleinert et al. 2015). These alternatives operate under local education agencies (LEAs) and they often serve students who exhibit academic and behavior challenges.

Alternative schools offered by LEAs may range from innovative school choice options to remedial programs that focus on academic or behavior remediation (Raywid, 1994). Innovative alternative schools typically offer specialized curricula with a focus on such things as art, technology, or language to students who enroll via a lottery system or a specific enrollment criterion. In contrast, remediation-focused alternative schools serve students who are referred or who need extra credits to earn a high school diploma.

Previous studies have shown that students with disabilities enroll in alternative schools at disproportionately higher rates than in traditional neighborhood schools (Lehr & Lange, 2003), as do students from culturally and linguistically diverse (CLD) backgrounds and students from low-income families (Carver & Lewis, 2010). In particular, students with emotional and behavior disorders (EBD) are more likely to be placed in alternative settings than students under other disability categories (Foley & Pang, 2006). There is very little known about students with ID's participation in alternative schools. A recent study examining the characteristics of students attending one Midwestern urban school district suggested that students with ID were more likely to attend traditional or innovative alternative schools rather than behavior or academic remediation-focused alternatives (Perzigian, Afacan, Justin, & Wilkerson, 2017).

The school type that students with ID attend merits special attention. In general, students with and without disabilities attending alternative schools have lower reading skills (Wilkerson, Gagnon, Melekoglu, & Cakiroglu, 2012; Wilkerson, Yan, Perzigian, & Cakiroglu, 2016). Also, the students' enrollment in alternative schools does not improve their reading outcomes on standardized reading tests across years (Drame, 2010). Moreover, attending a behavior or academic remediation-focused alternative school has significant predictive value for students' high school outcomes including attendance, credits earned, and ODRs, (Wilkerson, Afacan, Perzigian, Justin, & Lequia, 2016; Wilkerson, Afacan, Yan, Justin, & Datar, 2016). For students with ID, there is very limited knowledge related to their enrollment in alternative schools as well as their outcomes as a result of receiving services in these settings. They may be more likely to attend traditional or innovative school programs rather than remedial programs (Perzigian et al., 2017). Since there are no currently published examinations of academic and behavior outcomes of students with ID across school types, in this study I included school type in the analysis of academic and behavior outcomes of students with ID.

Statement of the Problem

Researchers and educators have often articulated that reading is an essential skill that students with ID must master. As students with ID consistently perform lower on standardized reading tests (Gronna et al., 1998; Thompson et al., 1999; Trexler, 2013, Wei et al., 2011), their achievement merits examination. Particularly, it would be helpful to know if the students' prior reading performances have predictive value for their later outcomes, as it does for other students (Adelson et al., 2016; Katsiyannis et al., 2008). Yet, there has been scarcity in research examining whether and how early reading predicts later outcomes for students with ID. At this point, there is a paucity of research evidence in this area. Are early reading levels important

because they have an impact on later reading achievement? Or is reading important because it increases students' engagement with school (e.g., attendance or credits earned)? Or is reading important because higher reading levels are associated with less later problem behavior? Answering these questions fills a gap in the literature related to the lack of evidence for the impact of early reading skills on students with ID's later academic and behavior outcomes. In this study, I examine whether 5th grade reading results on the WKCE and WAA have a predictive value for 8th grade reading results, secondary attendance, credits earned, ODRs, and suspensions received for students with ID.

Additionally, there is a need for research to examine the outcomes of students with ID by ethnicity/race and across types of schools. This study also addresses the gap in the literature in relation to school outcomes of students with ID by ethnicity/race and across the two different school types that they are likely to attend (i.e., traditional and innovative alternative). This study is the first attempt to provide an analysis of early reading, ethnicity/race, school type, and their impact on later academic and behavior outcomes for students with ID.

Purpose of the Study

There are four purposes of the current study. The first purpose is to examine whether 5th grade reading results of students with ID on statewide reading assessments predict their 8th grade reading results. The second purpose is to test whether 5th grade reading results of students with ID predict their secondary outcomes including school attendance, credits earned, ODRs, and suspensions received. The third purpose of this study is to evaluate the school outcome differences between White and non-White students (i.e., Black, Hispanic, and Asian) with ID. Lastly, the fourth purpose is to investigate whether the school type that students with ID attended

in middle and high school has a significant predictive value on their academic and behavior outcomes.

Research Questions

This study addresses the following research questions:

1. Is there a relationship between 5th grade statewide standardized reading assessment (WKCE and WAA) results of students with ID and their 8th grade results on the same assessments?
2. Is there a relationship between 5th grade reading results of students with ID on the WKCE and WAA assessments and the following secondary outcomes?
    a. Number of days in attendance during secondary school in one academic year;
    b. Number of credits earned in one semester of secondary school;
    c. Number of ODRs in one secondary school academic year;
    d. Number of secondary school suspensions received in one academic year.
3. Do students with ID's middle and high school outcomes (i.e., 8th grade reading, secondary attendance, credits earned, ODRs, and suspensions received) and/or their relationship to 5th grade reading vary significantly by ethnicity/race?
4. Do students with ID's middle and high school outcomes (i.e., 8th grade reading, secondary attendance, credits earned, ODRs, and suspensions received) and/or their relationship to 5th grade reading vary significantly by school type?

Hypotheses

Research questions 1 & 2: I hypothesized that students with ID's 5th grade reading achievement in the general and alternate assessments would significantly and positively predict their 8th grade reading achievement. I furthermore hypothesized that students with ID who had

higher reading performance in 5th grade would have (a) higher number of days in attendance in secondary school and (b) higher number of credits earned in one semester of secondary school. I hypothesized that students with ID who had higher reading performance in 5th grade would have significantly lower (c) ODRs and (d) suspensions in secondary school.

Research questions 3 & 4: I hypothesized that White students would have higher 8th grade reading results, higher attendance, higher credits earned, lower ODRs, and lower suspensions compared to their non-White counterparts. Finally, I hypothesized that students attending innovative schools would have higher 8th grade reading results, higher attendance, higher credits earned, lower ODRs, and lower suspensions compared to their counterparts attending traditional schools.

Organization of Manuscript

This manuscript is organized into five consecutive chapters. Chapter 2 provides a review of pertinent literature to situate the current study within the broader research field. Chapter 3 includes a description of the methodology of the current study including a description of sample, data sources, and analytical approaches used in the analyses. I report the results from the data analyses used to answer the research questions in Chapter 4. Finally, I discuss the implications of the findings, provide directions for future research, and acknowledge possible limitations of the study in Chapter 5.

Operational Definitions of Key Terms

Intellectual disability. Intellectual disability refers to "significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills and manifested during the developmental period that adversely affects the child's educational performance" (WDPI, 2017, Wisconsin State Law - Pl.11.36). Intellectual

functioning is defined as performing two or more standard deviations below the population, which equals an IQ score of 70 or below as measured by the standardized IQ tests (e.g., Stanford-Binet V; Wechsler Intelligent Scale for Children IV). Adaptive behavior is defined as a score of two or more standard deviations below the mean on standardized or nationally-normed measures as measured by comprehensive, individual assessments, that include interviews of the parents, tests, and observations of the child in adaptive behavior which are relevant to the child's age, including at least one of the following: Conceptual, social, practical adaptive skills, and an overall composite score on a standardized measure of conceptual, social, and practical skills.

Wisconsin Knowledge and Concepts Examination (WKCE). This is a statewide general assessment administered to all students in the state of Wisconsin. The WKCE is administered from grade 3 through grade 8 and once in high school.

Wisconsin Alternate Assessment (WAA). This is a statewide alternate assessment administered in the state of Wisconsin. It is designed by educators in Wisconsin and offered to students with significant disabilities (e.g., intellectual disability, autism, or multiple disabilities) who cannot participate in the WKCE general assessment, even with accommodations (WDPI, 2015). The WAA is administered from grade 3 through grade 8 and once in high school.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this study is to examine whether students with ID's 5th grade reading results from statewide general and alternate reading assessments have predictive value for their later academic and behavior outcomes: (a) 8th grade reading, (b) days of attendance in one year of secondary school, (c) credits earned in one semester of secondary school, (d) ODRs experienced in one year of secondary school, and (e) number of suspensions received in one year of secondary school. Additionally, this study examines whether students' ethnicity/race as well as school type (i.e., traditional vs. innovative) attended in middle and high school have significant predictive values on the previously described academic and behavior outcomes. What follows is a review of relevant literature on the following topics: (a) the relationship between early reading skill and later achievement, (b) statewide testing for students with ID, and (c) alternative school placement. These sections' aims are to help readers situate the current study within the larger literature related to these three main research areas.

Early Reading Skill and Later Achievement

In this section, I provide a summary review of the literature related to the role of early reading skill on students' later achievement. Since past studies have not clearly documented whether students with ID's early reading skill predicts their later outcomes, I briefly document what we know about this relationship for students in general. I organize this section into three parts. In the first part, I review literature on the relationship between early reading skill and later academic and behavior outcomes. Here, my aim is to answer the following question: Is early reading skill important for students' later achievement? In the second part, I introduce three

broad theoretical models of reading development that take students' initial reading differences into account and explains their reading development over time. In the third part, I explain why examining early reading skill and its relationship to other school outcomes is important for students with ID.

The relationship between early reading and later achievement. More than a decade long implementations of federal education laws and mandates (i.e., ESSA, 2015 [formerly known as NCLB, 2002]; IDEA, 2004) raised academic achievement standards for all students, regardless of their abilities. A recent study conducted by D'Agostino and Rodgers (2017) showed that each successive cohort of students monitored since NCLB went into effect in 2002 started first grade with increasingly higher reading skill. D'Agostino and Rodgers point out that even kindergarten students are now more ready to learn to read than their kindergarten counterparts were in the past. These recent findings are promising, but why is improved early reading skill important for students? Some researchers have indicated that improved reading skill in early ages can positively contribute to other school and life related outcomes such as later reading achievement, graduation, and employment (Barton, 2000; Conners, 2003). Below, I summarize results of studies that illustrate the positive and significant contribution of students' early reading skill to their later academic and behavior attainments.

I first begin with the relationship between students' early reading skill and their later academic outcomes. Adelson et al. (2016) examined the patterns of reading outcomes for students attending 3rd grade through 10th grade in Kentucky schools. They controlled for student, school, and district characteristics across all grade levels and multiple years for 2008-2010 student cohorts. Results from hierarchical linear modeling analyses suggested that students' prior reading achievement had a positive and statistically significant impact on their current year

reading achievement. Adelson et al. reported that the prior reading achievement explained 44% to 53% of variance in current reading achievement between students across grades and years.

Lesnick et al. (2010) examined the relationship between 3rd grade reading and the following four academic outcomes: 8th grade reading performance, 9th grade course performance including attendance and grade point average (GPA), high school graduation, and college attendance. Data were obtained from an administration of the Iowa Tests of Basic Skills (ITBS) to approximately 26,000 Chicago Public School students. Lesnick et al. tracked students from 3rd grade through potential college enrollment. The results suggested that 3rd grade reading level was strongly correlated with 8th grade reading level. Also, the students' 8th grade reading performance significantly predicted their 9th grade school attendance and GPAs. Additionally, reading level in 3rd grade positively and significantly predicted college attendance.

Scarborough (1998) examined correlations among reading, spelling, phonemic awareness, verbal memory, rapid naming, and IQ in a longitudinal sample of students. Reading test scores for 55 students – including students with reading disabilities and those without disabilities – at 2nd grade and 8th grade were examined. Findings from correlational analyses showed that students' 2nd grade reading score was the best predictor of later reading achievement for students without disabilities. Moreover, students with reading disabilities' 8th grade reading achievement was better explained when their 2nd grade reading test score was included in analyses along with other cognitive-linguistic measures, particularly rapid naming skill.

Hernandez (2011) used a national database including 3,975 students' information about their 3rd grade reading outcomes, socioeconomic status, and high school outcomes such as graduation rates. The students' reading progress was measured by using the Peabody Individual Achievement Test (PIAT) Reading Recognition subtest. The study's results showed that students

who were not proficient in reading by 3rd grade were four times more likely to leave school without a diploma than proficient readers. For those who could not master basic skills by 3rd grade, the chance of leaving school without a diploma was nearly six times greater.

As the studies noted above suggested, students' early reading performance significantly and positively predicted their later academic outcomes including later reading achievement, graduation, GPA, and college attendance. Does early reading skill also predict students' later behavior outcomes? Researchers have studied this question and presented evidence for the significant predictive impact of early reading skill on students' later behavior outcomes. To illustrate this point, Morgan, Farkas, Tufis, and Sperling (2008) used data from the Early Childhood Longitudinal Study to examine whether students' 1st grade reading outcomes had a relationship with their 3rd grade behavior outcomes. Results from multilevel logistic regression analyses suggested a significant relationship between early reading performance and later behavior outcomes. Students with poor reading skills in 1st grade were significantly more likely to demonstrate behavior problems, particularly in task engagement, poor self-control, internalizing behavior problems, and externalizing behavior problems in 3rd grade.

In another study, Lin, Morgan, Farkas, Hillemeier, and Cook (2013) used a nationally representative sample of 9,324 students to examine whether students' reading difficulties in 3rd grade increased their risk of behavior difficulties in 5th grade. The study's results from multilevel logistic regression analyses revealed a significant relationship between 3rd grade reading skill and 5th grade behavior problems. Students with low reading performance in 3rd grade were significantly more likely to demonstrate poor 5th grade task management, poor self-control, poor interpersonal relationships, internalizing and externalizing behavior problems.

In conclusion, this section's aim was to answer a main question: Does early reading skill have an impact on students' later outcomes? The quick answer to this question is "yes" as researchers have reported that students' early reading skill may be a significant predictor of their later reading as well as other specific academic and behavior outcomes. In the next section, I further my discussion and ask, "How do initial reading differences influence students' later achievement"? I present three theoretical models to study this question from different angles.

Theoretical models explaining initial reading differences and later achievement. On average, statistics show that students enter schools with improved early reading skill compared to their counterparts from 12 years ago (D'Agostino & Rodgers, 2017). However, some students may still exhibit reading difficulties due to their special status such as being identified as a student with a disability, a language or ethnic minority, an English language learner, or a student from a low socioeconomic status family; these students may fall behind their chronological age peers in reading over time (Leko, 2016). In contrast, initially poor performing students can acquire reading skill more rapidly than those who have high initial reading performance through formal systematic reading instruction in schools (Morgan, Farkas, & Wu, 2011). These different explanations mean that expecting all students have similar reading trajectories during their school years may be implausible. As Compton-Lilly (2012) suggests, time has a big influence on students' reading experiences because they negotiate and construct meaning of reading in relation to family, social, school or teacher expectations over time. Compton-Lilly states that students' reading skill and experiences are not stable but are temporal, which can involve various adopted or rejected reading preferences.

Pfost, Hattie, Dörfler, and Artelt (2014) described three broad developmental patterns focusing on the relationship between students' initial reading differences and their reading

development over time. These three broad developmental patterns are (a) Matthew effect, (b) a compensatory model or a developmental-lag model, and (c) stable achievement differences.

Some students may be more advantaged than others and may have better initial reading skill because they may read well, have good vocabulary repertories, or have access to a literacy-rich home environment. This initial gap between advantaged and disadvantaged readers – in other words, between "good" and "poor" readers – may result in a longitudinally widening gap over time. Stanovich (1986) described this special development pattern between good and poor readers with the term *Matthew effect*. According to the notion of the Matthew effect, good and poor readers exhibit divergent trajectories of reading development. While good readers show further positive reading gains, poor readers tend to experience negative, stable, or relatively small gains in reading skill over time (Leko, 2016; Stanovich, 1986; Walberg & Tsai, 1983).

A compensatory model or a developmental-lag model of reading development suggests a negative relationship between students' initial reading level and developmental gains. According to this model, students who initially performed lower might increase their reading skill to a greater extent than those who initially performed higher over time. For example, initially higher skilled students' reading proficiency level in a statewide reading examination might be stagnant over time because of a ceiling effect; on the other hand, initially less skilled students' reading proficiency level might increase dramatically in the same assessment over time owing to the amount of growth available to them. Basically, the compensatory model indicates that "with practice, less skilled readers will eventually catch up, and the gap between skilled and less skilled readers will decrease " (Cunningham & Chen, 2014, p. 1).

According to yet another model suggesting *stable achievement differences*, students' reading performance neither increases nor decreases across time (Pfost et al., 2014). As the

model's name indicates, students' reading skills are hypothesized to remain stable relative to their peers as students progress between grade levels.

Researchers have widely used these three models to understand reading development trajectories of students. Specifically, the Matthew effect model has been proposed as a general framework to study inter-individual differences in reading development (Stanovich, 1986). In a systematic review of 28 studies examining students' reading development patterns, Pfost et al. (2014) reported that a majority of studies found a compensatory pattern, i.e., a decreasing gap, as opposed to an increasing or stable pattern. However, researchers reported that the presence or absence of a specific reading development pattern varied based on the specific reading skill assessed in longitudinal studies. For example, while studies using constrained skills (e.g., letter naming, concepts of print) or decoding accuracy as outcome measures reported a compensatory pattern, studies using composite reading scores as outcome measures found an increasing achievement gap pattern, i.e., a Matthew effect, in students' reading development.

For more specific studies related to this topic, it is worth referring to a special issue of the *Journal of Learning Disabilities* (2011) in which researchers published results of studies of students' reading growth trajectories over time. Cain and Oakhill's (2011) study was one of the studies published in the special issue. Their study focused on a longitudinal examination of reading comprehension and vocabulary development of children between 8 and 16 years old over a 4-year period in England. Researchers found evidence for a Matthew effect in vocabulary development (i.e., sight and receptive vocabulary) but not in reading comprehension. They suggested that better readers got better and poor readers got poorer in terms of reading vocabulary development.

Luyten and Bruggencate's (2011) study used a nationally representative sample of 5,150 Dutch students to examine students' general language skills over a 6-year period. The researchers' findings illustrated both a Matthew effect and a compensatory pattern (i.e., poor readers gained more reading skill than better readers over time). The researchers reported an increased achievement gap between students from well educated and poorly educated parents as well as students with low and high socioeconomic status (SES). In contrast, they found a closing achievement gap between male and female students' languge skills over time. They concluded that the presence of a Matthew effect depended on the specific skills measured in the study.

Morgan et al. (2011) examined the reading growth of students with learning disabilities (LD) and speech and language impairment (SLI) as well as those without disabilities over a 5-year period in the U.S. They reported that over the 5 subsequent years of elementary school, only children with SLI fell increasingly behind students without disabilities in their reading growth. Further analyses revealed that students with low SES, who were also Black, and who had learning-related behavior problems had lower levels of initial reading skill and also lagged increasingly behind in their reading acquisition over time. In conclusion, Morgan et al.'s study did not suggest a clear Matthew effect in reading growth for students with and without disabilities.

As described above, past studies have suggested possible different reading development patterns for students without disabilities and with some specific disabilities (i.e., LD and SLI). Research on reading instruction for students with ID has a long history in special education (Katims, 2000); however, the relationship between these students' reading development over time and other important school outcomes has yet to be uncovered. What we know from past studies is that students with ID typically have less-developed reading skill compared to their

counterparts with other disabilities and without disabilities (Katims, 2001; Trexler, 2013; Wei et al., 2011). They may have difficulties and lag behind their grade level peers in reading but, with grade level and evidence-based instruction strategies in schools, they can acquire complex reading skills evidenced in outcomes such as reading vocabulary and comprehension (Hudson, Browder, & Wood, 2013; Mims, Browder, Baker, Lee, & Spooner, 2009; Ruppar, Afacan, Yang, & Pickett, 2017).

A limitation of past research is that researchers often used aggregated datasets that do not allow examination of specific subgroups. When students with disabilities were included in datasets, generally two disability categories (i.e., LD and SLI) were involved in analyses. This hinders our understanding of within group differences in reading development that have implications for interventions as well as for accountability (Schulte, Stevens, Elliott, Tindal, & Nese, 2016). As the studies cited in this section suggested, different outcomes in early grades may lead to different reading development patterns during middle and high school. The characteristic of a developmental pattern may be quite different for students with low academic and adaptive behavior skills, like those with ID. Thus, researchers should also examine early reading skill and its relationship to later achievement for specific subgroups. In this study, my aim is to add to the existing literature by examining the predictive impact of early reading performance on later academic and behavior outcomes for students with ID.

Why is it important to examine the impact of early reading on later outcomes for students with ID? Until recently, the reading development of students with ID has not been adequately examined. Furthermore, students with ID are often excluded from statewide testing or accountability altogether (Schulte et al., 2016). Also, researchers and educators have historically utilized reading instruction approaches that have not allowed a longitudinal examination of

reading performance for students with ID. Mainly, they have been taught to master reading skills via two major approaches: Readiness and functional reading (Brown, Huppler, Pierce, York, & Sontag, 1974; Copeland & Keefe, 2007). These two approaches have emphasized that students (a) need to master pre-reading skills such as phonics (letter-sound relationships) that are considered necessary for learning more advanced skills such as reading comprehension and (b) functional sight words that are considered necessary for them to navigate school and community environments. Yet, both of these approaches had limitations and focused almost exclusively on identifying sight words (Browder et al., 2006). Thus, many students with ID repeatedly received the same or similar reading instruction from early grades until they graduated from high school.

During the last 17 years, national reports on reading (e.g., NRP, 2000) and major federal education laws and mandates (i.e., ESSA, 2015; IDEA, 2004) have laid the foundation for a drastic shift in the way that reading instruction has been conceptualized for students with ID. Recently, some special education researchers and educators have been implementing longitudinal studies including multicomponent reading approaches for students with ID (e.g., Allor et al, 2014; Browder et al., 2012). Compared to historical reading instruction strategies targeting a single component, in these longitudinal studies researchers carefully integrate multiple reading components and activities into reading instruction. In a systematic review of literature on multicomponent reading interventions for students with ID, Afacan et al. (2017) identified only seven published research studies between 2008 and 2014. The researchers identified a variety of evidence-based strategies in multicomponent interventions such as read-aloud, repeated trials, prompting procedures, time delay, and direct instruction. All of these studies targeted the reading skills of elementary age students. The purpose was to support the students' reading skills across five components of reading – beginning with concepts of print and

phonemic awareness – as early ages as possible. It is expected that students who master these skills in their early grades are more likely to become effective readers than students who do not have these skills (Browder et al., 2009). Also, mastery of these skills as early as possible may influence the acquisition of other reading skills for students with ID (e.g., vocabulary, Wise, Sevcik, Romski, & Morris, 2010).

Based on the developments in reading instruction for students with ID during the last 17 years, researchers can set hypotheses such as (a) students with ID's reading performance will improve over time, or (b) students with ID's improved reading performance will significantly contribute to their high school attendance and credits earned, or (c) students with ID's improved reading performance will significantly reduce negative behavior outcomes such as number of ODRs and suspensions received. However, there is paucity in research at this point. These hypotheses have not been tested for students with ID. The current study addresses this critical gap in the literature by testing whether early reading performance predicts students with IDs' later outcomes, as it does for other students without disabilities.

The main aim of this study is to examine the relationship between early reading skill and middle school reading achievement for students with ID. I also include four secondary outcomes: Attendance, credits earned, ODRs, and suspensions. I chose these secondary outcomes because they may also be correlated with students' prior reading achievement. For example, Kleinert et al. (2015) found statistically significant correlation between students with ID's reading skill and increasing rates of attendance in inclusive settings. Kearns, Towles-Reeves, Kleinert, Kleinert, and Thomas (2009) found that a small percentage of students with ID had irregular attendance but they pointed out that this might adversely affect the opportunity to learn. Credit earned is

another outcome measure that indicates a students' performance in core academic areas (e.g., reading) and that predicts his/her high school graduation (Allensworth & Easton, 2005).

Students with ID may also exhibit a variety of instructional challenges and "may require time-intensive interventions to decrease challenging behavior, learn replacement behaviors, and acquire new skills" (Boutot, Turner, & DiGangi, 2018, p. 112). In some situations, the students' challenging behavior may receive formal responses from school leadership or teachers such as in or out-of-school suspensions. Skiba, Paterson, and Williams (1997) reported that students with mild ID were more likely to be suspended than students without disability. Skiba, Poloni-Staudinger, Simmons, Feggins-Azziz, and Chung (2005) reported a link between district rates of suspensions and predicted district rates of identification for students with mild ID. Krezmien, Leone, and Achilles (2006) examined Maryland's suspension data from 1995 to 2003 and reported high suspension rates for Black students with ID. As these studies revealed, examining students with ID's reading performance along with additional academic and behavior outcomes will be more informative than examining only their reading outcomes. Thus, I include attendance, credits earned, ODRs, and suspensions received in this study and test the predictive impact of the students' early reading performance on these additional secondary outcomes.

In the next section, I provide a review of literature on the use of statewide assessments for students with ID. Especially after 2000, there has been a significant change in the educational experiences of students with ID in schools. Due to mandates of federal education laws, an increasing number of students with ID have taken statewide general reading assessments. Moreover, students with ID who could not participate in general assessments participated in alternate reading assessments. Both general and alternate assessments yield an important source of information related to students with ID's reading achievement levels because all states have

been tracking student performances from 3rd grade to high school. In this study, I use students with ID's test results from these two statewide reading assessments.

Statewide Testing for Students with ID

I organize this section into three parts. First, I begin with an introduction of two major statewide assessments that allow students with ID to participate in the school accountability system: statewide general and alternate assessments. Second, I focus on some major issues related to the use of alternate assessments for students with ID. This includes a discussion of the past decade's research focusing on reliability and validity of statewide assessments as well as major changes that these assessments proposed in the education of students with ID. Additionally, I discuss how previous research has informed this study. Third, I examine students with ID's performance on statewide reading assessments based on the available literature.

Statewide general and alternate assessments for students with ID. During the last decade, policy makers as well as education researchers have shown great interest in the implementation of statewide-standardized assessments for all students attending U.S. schools. The NCLB and its reauthorization, ESSA (2015), mandate that "states must continue to test all students on statewide assessments in the following areas: Reading/language arts and math every year in grades 3-8 and once in high school…" (p. 3). This system requires that students' development is tracked as they move through grade levels and also their performances are increased along with the overall performance of schools they attend. Results from statewide assessments are used to provide federal funds for schools as well as to identify lower performing schools in order to offer solutions to their unique challenges (Fremer & Wall, 2003).

Prior to the passage of NCLB, only a small percentage of students with disabilities participated in statewide general assessment and accountability systems (Erickson, Thurlow, &

Thor, 1995). However, NCLB required that students with disabilities be included in accountability systems along with their peers without disabilities. The most recent special education law, IDEA (2004), also makes it clear that students with disabilities must participate in statewide assessments: "All children with disabilities are included in all general state and district-wide assessment programs… with appropriate accommodations and alternate assessments where necessary and as indicated in their respective individualized education programs" [612(a)(16)(A) of IDEA]. As the statement indicates, students with disabilities can participate in accountability systems via one of the two allowable statewide assessments: (a) statewide general assessment and (b) statewide alternate assessment.

Students with ID can participate in statewide general assessments with or without accommodations. However, some students with ID, particularly those with moderate to severe ID, cannot participate in general assessments due to limitations in intellectual functioning and adaptive behavior, as well as difficulties in expressive and receptive communication (Kearns et al., 2009). For these students, the IDEA (1997) mandated the use of alternate assessment standards across the country. First attempts regarding the development of alternate assessments began in Kentucky and Maryland during the early 1990s (Quenemoen, 2008). Other states also rapidly developed and implemented alternate assessments as a result of the provision of IDEA (1997). By 2005-2006, all states had at least one alternate assessment in place for students who could not participate in statewide general assessments (U.S. Department of Education, 2009).

WKCE (general assessment) and WAA (alternate assessment) are examples of how the federal legislation is interpreted in Wisconsin. Compared to the general assessment that the majority of students take, the alternate assessment is administered to "any student with significant disabilities when the local IEP team determines that the student should not participate

in the WKCE (general assessment) with or without accommodations" (WDPI, 2015, p. 2). Wisconsin educators design and administer alternate assessments from 3rd grade to 8th grade and once in high school. The state has been using a variety of approaches to assess students' progress toward alternate standards. These include portfolio or body of evidence (e.g., collections of student work samples such as videos, photographs, or worksheets), rating scales or checklists, and multiple choice or constructed response tests (Cameto et al., 2009; WDPI, 2015). Although, this wide variety of methods for assessing student progress via alternate assessments is allowed, the assessment results generated must meet federal reporting guidelines and also should inform research and teaching in the classrooms (Johnson, 2012).

Students' participation in alternate assessments is determined by specific guidelines and procedures in each individual state. However, IEP teams make the final decision for who is going to take alternate assessments (Musson, Thomas, Towles-Reeves, & Kearns, 2010). Findings from previous studies conducted across several states show that students with ID, autism, and multiple disabilities constitute the vast majority of students taking alternate assessments (Kearns et al., 2009). Among these three groups of students, national statistics suggest that students with ID represent the largest group of students taking alternate assessments (Cameto et al., 2009).

Researchers have also examined the learner characteristics of the students taking alternate assessments. From elementary to high school, these students usually demonstrate a very basic level of reading such as being able to read basic sight words, simple sentences, directions, bullets, and/or lists in print or Braille, but not fluently from text with understanding (Towles-Reeves, Kearns, Kleinert, & Kleinert, 2009). Kearns et al. (2009) found that most of these students had symbolic communication skills including using verbal or written words, signs,

Braille, or language-based augmentative and alternative communication (AAC) to request, initiate, and respond to questions. Students taking alternate assessments had a high percentage of school attendance, i.e., at least 90% of the days with a mean of 87.4% (Kearns et al., 2009).

Issues related to the use of alternate assessments. Prior to the participation of students with ID in statewide general or alternate assessments, educators, policy makers, and the public had very limited information regarding whether students with ID had meaningful and effective education in schools (Roach, 2005). Today, when alternate assessments are designed and implemented effectively, they may be an important source of information for different stakeholders as they are: (a) measures of student learning in classes, (b) aligned to grade level academic standards, and (c) an important part of adequate yearly progress (AYP) calculations. Researchers have conducted several studies to examine various aspects of these assessments since 1997 when the use of alternate assessments was first mandated. Some of these research areas were mentioned above (e.g., who takes alternate assessments). In this section, I discuss some other issues related to the use of alternate assessments including their content validity, alignment with general standards, use for instructional purposes, and results. In the end, I discuss how this study is informed by the alternate assessment literature.

Bolt and Roach (2009) suggested that "the assessments used in large-scale assessment and accountability systems need to be technically adequate measures of academic performance and meaningful and manageable tools for test users including teachers, administrators, and parents" (p. 3). Past research has examined how states defined alternate assessments and whether their contents were aligned with general standards. Findings illustrated that there was no unified standard for these assessments and definition and alignment of alternate assessments varied across states. For example, Browder et al. (2005) conducted a study to examine how alternate

assessments were defined and aligned with state general education standards. The researchers collected documents related to alternate assessments (e.g., administration manuals, assessment booklets) from 42 states and analyzed them. They reported variations in labeling, defining, scoring, and alignment with general education standards. They found that not all alternate assessments were aligned with state standards. Similarly, Johnson and Arnold (2007) examined alternate assessment results from one state to learn whether the assessment was aligned with the state's general curricular standards and types of tasks that were performed to measure general standards. The researchers reported that more than 90% of portfolios were linked to the state's general education content standards. However, they also reported a content underrepresentation in the actual assessment tasks. The assessment tasks did not meaningfully reflect the content area. These findings clearly raised several questions about the technical quality, reliability, and validity of alternate assessments during the past decade (Bolt & Roach, 2009).

Participation of students with ID in statewide assessments has also led to changes in special educators' classroom practices. Research has emphasized the importance of providing training for teachers during the implementation and evaluation of alternate assessments. Some challenges that teachers expressed in practice focused on the tension between functional and academic curricula, access to general curriculum, and using assessment results to make adjustments in instruction. The functional curriculum has been predominantly used in the education of students with ID until recently. However, federal education laws mandate that all students – including students with ID – make progress in academic curriculum and demonstrate proficiency in grade level standards. Browder, Wakeman, and Flowers (2006) reported some special educators' concerns regarding a test-based accountability system that exclusively focused on academic curriculum. In their study, special educators indicated that students with ID needed

functional curriculum that focused on the students' individual needs. These teachers believed that their students with ID might drop out of school and could have limited school outcomes as a result of an academic curriculum focus.

Similarly, in a recent study examining the current state of general education curriculum access from the perspectives of teachers who teach students with significant ID in a Midwestern state, Petersen (2016) reported that special educators expressed confusion about what academic curricular access meant to them. Teachers considered IEPs, alternate assessments, and state standards separately and made preparations for each. Having a diverse group of students from different grade levels in special education classrooms made it difficult for teachers to align curricula they teach with general education curriculum. Teachers often had to switch from functional curriculum to academic curriculum or vice versa to address the needs of their students. This dichotomy in teaching usually led to confusion among special educators. These challenges were also evident in Towles- Reeves, Kleinert, and Muhomba (2009)'s systematic literature review about the use of alternate assessments since their first implementations. Based on the review of 40 empirical studies they noted: (a) a need for determining how alternate assessments can direct instructional choices on academic content areas for students with significant ID, (b) lack of a well-defined connection between alternate assessment results and IEP quality, and (c) the need for teacher training in how to integrate state standards via alternate assessments into teaching activities to help students with ID access the general curriculum in meaningful ways.

Notwithstanding concerns of assessment quality and teacher readiness, an increasing number of students with ID have been taking general or alternate assessments over the past decade. Therefore, achievement of students with ID in these assessments requires special attention and careful examination. At this point, it is important to examine whether these

students' assessment results can be used to make predictions about their later outcomes. This is a relatively new research area because research over the preceding decade mainly focused on establishing reliable and valid alternate assessments. Thus, little is known about how well alternate assessment results predict other educational outcomes. Some researchers have pointed out a need for research examining whether alternate assessment results have any predictive impact on students' other educational outcomes (Browder 2001; Kleinert et al., 2002; Towles-Reeves et al, 2009). Following are some of those recommendations:

> "Much more has been written in the professional literature on how to develop alternate assessment than on what to do with the information obtained. If alternate assessment information is not used to make decisions, there will be no benefit for students with disabilities" (Browder, 2001, p. 78).
>
> "If alternate assessments are to be viewed as useful tools for program evaluations, then there must be evidence that how students do on alternate assessments relates to other measures of student outcomes" (Towles-Reeves et al., 2009, p. 244).
>
> "Has the state ascertained that test scores are related to outside variables as intended?" (Kettler et al., 2010, p. 458).
>
> "It is not enough for states to establish trend lines illustrating that increasing numbers of students are achieving proficiency on their respective state alternate assessments. Rather, researchers must show how improved alternate assessment scores correlate with other valued measures of student learning and outcomes" (Towles-Reeves et al, 2009, p. 248).

A lack of information regarding how assessment results relate to other important student outcomes limits researchers' abilities to draw conclusions about the predictive impact of these assessments. As indicated above, researchers highlight that this issue needs to be addressed in the

field. Yet, there is still a paucity of research at this point. This study aims to address this gap in the literature. I follow Kleinert et al.'s (2002) recommendation to examine students with ID's reading results from both general and alternate assessments because improving students' outcomes is an important issue for students in both general and alternate statewide assessments. Kleinert et al. reported that alternate assessment results did not significantly predict 12th graders' post school outcomes including: Choice and decision-making, friendship and relationships, community integration, and employment. Based on the findings from this study, they recommended that further research was needed to examine whether participation and performance of students in different statewide assessments (i.e., general vs. alternate) had any relationship with other school outcomes (Kleinert et al., 2002).

Students with ID's performances in statewide general assessments are concerning as they usually have the lowest performance among all students. On the other hand, the examination of students' performance on alternate assessments is a relatively new research topic and has promising implications. For example, Bolt and Roach (2009) state that this examination can show adequate progress toward being proficient in reading as well as facilitating inclusion and increasing motivation for special educators to implement academic curriculum and instruction for students with ID. Moreover, a systematic examination of alternate assessment results and their relationship to other educational outcomes may help educators to support their efforts in providing effective instruction to students with ID (Bolt & Roach, 2009). Thus, more research is needed in this area. What may be valuable for the field is to examine these two assessment types together, instead of focusing on one at a time. I include students with ID's prior reading performances from both assessment types in this study and examine whether they predict

students' later academic and behavior outcomes. In the following section, I provide a brief overview of students with ID's performance in statewide general and alternate assessments.

Performance of students with ID on statewide general and alternate assessments. Fulfilling the requirements of federal education laws has been used to justify research on reading instruction for students with ID. ESSA (2015) and IDEA (2004) both hold schools accountable for including students with ID, along with students receiving services in other disability categories, in statewide general or alternate assessments. These tests require students to demonstrate complex reading skills such as determining the meaning of words and phrases in context, as well as understanding, analyzing, and evaluating text (WDPI, 2014). Students with ID who have limited reading skills may fail in these exams; thus, nurturing their skills across multiple components of reading (e.g., comprehension, vocabulary, fluency, phonics, phonemic awareness) is one way to increase the chance that they will be more successful on these exams.

Research on reading outcomes of students with ID on statewide general or alternate reading assessments is still rare. The existing research suggests that students with ID have the lowest reading outcomes on statewide general assessments of all students with disabilities (Schulte et al., 2016; Thompson et al., 1999; Trexler, 2013). Additionally, research suggests that very low percentages of students with ID perform at proficient or advanced levels on statewide general reading assessments. Illustrating this point, Trexler (2013) compared the assessment results of students with disabilities on statewide general assessments in Florida. Trexler found that students with ID had the lowest performance on statewide reading assessments among all students with disabilities. Trexler reported that only 3% of students with ID performed at the proficient level in reading in fourth and fifth grades.

In another study, Thompson et al. (1999) examined the statewide general reading assessment results of students with disabilities in Minnesota. The researchers reported that only 1% of eighth grade students with mild to moderate ID and none of the students with moderate to severe ID scored in the proficient range in the statewide reading exam. Similarly, in an examination of student outcomes on a statewide general reading exam in Hawaii, Gronna et al. (1998) found that students with ID performed lower on the reading assessment than students with specific learning disability, EBD, and students without disabilities across grade levels.

In a recent study, Tindal, Nese, Farley, Saven, and Elliott (2016) examined the achievement growth of a sample of 1,061 elementary students taking Oregon's alternate reading assessment from grade 3 to grade 5. The researchers reported that the majority of students remained in the same proficiency levels across years. Fewer than 9% of students improved their reading scores from below proficiency to above. However, they also found that students who had proficient or above level on the grade 3 assessment scored significantly higher on the grade 5 assessment compared to students who were below the proficient level in grade 3. Also, students who were taught in general education settings significantly improved their test scores from grade 3 to grade 5 compared to their counterparts who were educated in outside of general education settings.

These previous studies have demonstrated that students with ID were more likely to have poor outcomes on statewide general reading assessments and were more likely to stay in the same proficiency level on statewide alternate assessments over time. However, there has not been a study examining assessment results to learn whether results for students with ID from either the general or alternate assessments have a relationship with middle and high school outcomes. Therefore, there is a need for an examination of students with ID's reading

performances in both general (WKCE) and alternate (WAA) assessments in order to examine whether these reading performances have any predictive impact on the students' later academic and behavior outcomes. The purpose of the current study is to examine the relationship between 5th grade reading outcomes of students with ID on statewide general and alternate reading assessments and their middle and high school academic and behavior outcomes.

In addition to early reading performance on statewide assessments, it is also important to take into account the characteristics of students and the schools that they attend. Past research has suggested that students' reading performances and high school outcomes varied based on their ethnicity/race (Adelson et al. 2016; Hernandez, 2011; Lesnick et al. 2010). Additionally, Adelson et al. (2016) reported that school characteristics explained 2 - 11% of between-school variance on reading outcomes across years. Lesnick et al. (2010) found that 9th grade school characteristics significantly explained students' 9th grade academic outcomes including school attendance and GPA. Similarly, Aikens and Barbarin (2008) found that school characteristics such as school type (private vs. neighborhood), location in high-poverty area, and number of students with poor reading outcomes enrolled in the school significantly explained a large portion of difference in students' monthly reading growth. For these reasons, I turn my attention to school options that are available for students in the public education system. I particularly focus on alternative schools because LEAs commonly offer them to students, along with traditional neighborhood schools.

Alternative School Placement

The purpose of this section is to provide a summary of the literature related to alternative schools. First, I introduce a framework to categorize various alternative schools into three types.

Second, I provide a review of research on the impact of alternative school placement on students' school outcomes. Third, I discuss students with ID's enrollment in alternative schools.

Framework to categorize alternative schools. Alternative schools have existed in the U.S. public education system since the 1950s. Beginning in the 1950s, these schools took many names and forms within the public education system such as: schools without walls, schools within a school, multicultural schools, continuation schools, learning centers, fundamental schools, and magnet schools (Lange & Sletten, 2002). LEAs offer alternative schools as options to students who present academic and behavior challenges in traditional neighborhood schools (Lehr, Tan, & Ysseldyke, 2009). What differentiates alternative schools from traditional neighborhood schools is that they typically offer small classroom size (e.g., 20 students maximum), a supportive environment, individualized instruction, and flexibility in school structure and instructional format for their students (Tobin & Sprague, 2000). Across the country, 64% of all public school districts reported that they offered alternative schools for students who demonstrated academic and behavior challenges and the total enrollment in these schools was 645,500 students as of the 2007-08 academic year (Carver & Lewis, 2010).

Providing a framework to categorize alternative schools has presented a challenge for researchers because of their varying and distinctive features. Mary Anne Raywid (1994) created a framework that still has applicability in today's education system. In her framework, she categorized various alternative school types into three broad categories: (a) *innovative schools* (Type 1), (b) *behavior-focused alternative schools* (Type 2), and (c) *academic remediation-focused alternative schools* (Type 3). In this study, I use Raywid's (1994) framework to define alternative school types that students with ID may attend. This includes alternatives that are available to both students with and without disabilities in LEAs. Separate special education

schools serving solely students with disabilities are not included in the definition of alternative schools. Below, I provide a brief description of each school type.

Innovative schools can be defined as offering specialized curricula or programs – including, but not limited to, business, art, technology, and language – for their students. They generally accept students via a lottery system or a specific requirement (e.g., an achievement test or statewide reading assessment score). One of the main goals of innovative schools is to address the unique needs of students by using innovative approaches. In this regard, these schools do not aim primarily to remediate students' academic and/or behavior difficulties (Lange & Sletten, 2002). It is the responsibility of behavior-focused and academic remediation-focused alternative schools to remediate students' academic and behavior difficulties.

Behavior-focused alternative schools have been defined as "last chance schools" for students who exhibit behavior difficulties, prior to expulsion (Raywid, 1994, p. 27). Enrollment in this school type is not typically open to all students. LEAs refer students with chronic behavior problems (e.g., students who receive an excessive number of suspensions) to this type of school. The students receive intensive behavior interventions over a specific time period that may vary from one semester to an entire academic year. If the interventions provided at the alternative school are effective in remediating students' behavior problems, students may be allowed or encouraged to return to a traditional school. Academic remediation-focused alternative schools have the primary aim of remediating students' academic as well as behavior difficulties. Students who need extra credits to catch up with their chronological age peers in order to obtain a high school diploma may attend this school type.

Research on alternative schools. In this section I describe the historical function of alternative schools within the public education system as well as the literature related to the

educational experiences of students attending them. The existing research can be categorized into two main areas: (a) studies examining the characteristics of alternative schools and students attending them and (b) studies examining the academic and behavior outcomes of students attending alternative schools.

The existence of alternative schools in the public education system can be implicated in fostering segregation based on ethnic and economic differences, which then plays a role in limiting access to equal educational opportunities. Some researchers have argued that alternative schools perpetuate racial and economic stratification in the U.S. public education system and purposefully segregate students who experience multiple risk factors (e.g., students who are poor and students with disabilities) from mainstream education (Davis, 2014; Saporito, 2003). Researchers have examined this issue at state and national levels. Several studies examining the characteristics of alternative schools and students attending them have found that male students and students with disabilities, particularly those identified with EBD, are enrolled in alternative schools at disproportionately higher rates than in traditional neighborhood schools (Foley & Pang, 2006; Lehr et al., 2009; Lehr & Lange, 2003; Wilkerson et al., 2016). National statistics suggest that the majority of students attending alternative schools are from households with low SES and that students of color are overrepresented (Carver & Lewis, 2010).

Alternative schools serve a more diverse student population than traditional neighborhood schools (Carver & Lewis, 2010; Foley & Pang, 2006). The disproportionate enrollment of students with disabilities in these settings merits particular attention, since past studies have revealed a general concern regarding the readiness of alternative schools to address the unique needs of students with disabilities. For example, Lange (1998) reported that the lack of special education personnel, open unstructured environments, and accessibility issues limited

the appropriateness of these settings for students with disabilities. Lehr et al.'s (2009) survey of alternative school directors identified a lack of qualified staff, unclear procedures related to exit, and provisions of appropriate services as major concerns. In another survey that examined supplemental reading instruction provided in alternative secondary settings, Wilkerson, Yan et al. (2016) reported that a lack of staff and instructional resources such as appropriate curricula, computers, and appropriate software were barriers to provision of effective reading instruction for students with disabilities in these settings. If students with disabilities continue to be educated in alternative schools, a closer examination of student outcomes is needed to understand whether students in alternative schools have access to equal educational opportunities as compared with their peers in traditional school settings.

However, researchers have paid scant attention to student outcomes at alternative schools. Over a decade ago, Lange and Sletten (2002) reported that the existing research failed to provide evidence for the effectiveness of alternative schools in improving students' academic and behavior outcomes. Moreover, a literature review of behavior interventions implemented in alternative settings found that the majority of interventions did not include effective practices and that the quality of the studies overall was relatively low (Flower, McDaniel, & Jolivette, 2011). Below, I provide a summary of studies in which researchers examined the educational experiences of students attending alternative schools.

First, I begin with a summary of studies employing qualitative research methodologies. In general, these studies documented a positive impact of alternative school placement – though, in some cases, negative aspects of alternative school placement were highlighted. For example, using a critical ethnographic methodology, Watson (2011) conducted a study about one alternative school's culture related to students' learning, discourses, relationships, and challenges

in a Midwestern city. Watson reported that the alternative school provided a flexible learning environment and built trust and strong relationships between students and teachers. On the other hand, students attending the alternative school were also often marginalized and excluded from general educational practices. For example, they were not allowed to visit their traditional school and were not allowed to use the same public resources, such as a public library, that their peers who attended traditional schools were encouraged to use. McKee and Conner (2006) provided a qualitative examination of an alternative program that was successful in helping students who were at risk of school failure to improve scores in the areas of reading, math, science, and social studies in the state of Virginia. They highlighted the alternative school's flexible environment and curriculum, small classroom sizes, and ability to provide individual attention to students as key components of its success.

Using a qualitative case study methodology, Lagana-Riordan et al. (2011) interviewed students who were at risk of school failure and were attending a public alternative school to examine their experiences. Students attending this alternative school indicated that their experiences were positive. They expressed that they had positive relationships with teachers, improved self-perception of their own maturity and responsibility, and improved understanding of social issues. Additionally, they reported establishing better relationships with peers in a supportive atmosphere as compared with previous relationships at their former traditional schools. Using a mixed design methodology, Amin, Browne, Ahmed, and Sato (2006) examined the effectiveness of an alternative school designed for pregnant and/or parenting teens in the Baltimore Public School System. The researchers reported that the alternative school provided strategies to increase the teens' educational aspirations and performance, a supportive learning environment, social services related to pregnancy, and mental health services.

Second, I continue with a summary of research that has quantitatively examined the impact of alternative school placement on the students' academic and behavior outcomes. These studies have pointed to mixed effects of alternative school placement. For example, Chiang and Gill (2010) examined statewide-standardized reading and math test scores of students attending traditional and alternative schools in the city of Philadelphia. They reported lower standardized math and reading scores for students attending alternative schools compared with students attending traditional schools. Dugger and Dugger (1998) and Tenenbaum (2000) reported very little or no change in student outcomes, and in some cases even a drop on LEA-administered standardized tests, as a result of attending alternative schools over the course of one year. Franco and Patel (2011) examined the academic outcomes of students attending an alternative remediation program. They found on one hand, the alternative program was effective in improving the credit accruals of students; on the other hand, the program did not yield an increase in overall GPA. Similarly, Franklin, Streeter, Kim, and Tripodi (2007) examined differences in academic outcomes for students attending alternative as compared with traditional schools. They found that students attending alternative schools earned significantly more credits than their counterparts who remained in traditional schools. In contrast, students attending traditional schools had higher school attendance and graduation rates than students attending alternative schools. In another study, Drame (2010) compared the 4^{th} and 5^{th} grade standardized reading and math test scores of students with and without disabilities attending public alternative schools in an urban school district. Drame reported that students with and without disabilities' reading and math performances did not differ significantly and even decreased as a result of attending alternative schools after one school year.

More recent investigations have also confirmed previous findings as outcomes for students attending alternative schools were mixed. Wilkerson, Afacan, Perzigian et al. (2016) examined the impact of behavior-focused alternative schools on students' academic and behavior outcomes. Using a propensity score matching technique, the researchers matched students attending behavior-focused alternative schools with students attending traditional schools. The study showed that students attending behavior-focused alternative schools had significantly less secondary school attendance, earned significantly fewer credits, and experienced significantly fewer suspensions compared to their counterparts who remained in traditional schools.

In another recent study, Wilkerson, Afacan, Yan et al. (2016) examined the impact of academic remediation-focused alternative schools on students' academic and behavior outcomes. The researchers identified similar students across academic remediation-focused alternative schools and traditional schools and examined student outcome differences. They concluded that students attending academic remediation-focused alternative schools earned significantly more credits and had significantly less ODRs than students attending traditional schools. However, students attending traditional schools had significantly higher school attendance. All of these examples suggest that there is a need for further research to examine the effectiveness of different alternative school types on the school outcomes of students attending them.

Students with ID's enrollment in alternative schools. Historically, individuals with ID have often been placed in non-traditional settings. Until the 1960s and 1970s, individuals with ID were most often placed in separate schools or institutions that were designed specifically for them. During this time, "individuals with intellectual disabilities were considered unable to learn and were systematically assigned to institutions for care but not for learning" (Downing, 2010, p. 2). Individuals with ID were often marginalized and dehumanized. Professionals often

recommended that families place their children with ID into institutions right after birth in order to protect the family and society's wellbeing (Ferguson, 2008).

Fortunately, these practices changed beginning in the 1970s. Parent and professionals' advocacy led to provisions of federal legislation, The Education for All Handicapped Children Act (EAHCA) of 1975, which laid the groundwork for a deinstitutionalization movement. The EAHCA dramatically altered practices in the educational placement of individuals with ID. For example, many young people with ID left institutions and began to attend their neighborhood schools. According to Brown et al. (1989), moving out of institutions and attending neighborhood schools were important to engender a pluralistic society, to use the most meaningful instructional environments, to enhance family access to neighborhood schools, and for students with ID to develop a wide range of social relationships with students without disabilities.

Today's public education system offers a variety of placement options for students with ID and their families. As previously described, these options range from traditional to alternative schools that offer specialized programs that can align with interests and priorities of students and their families. The availability of school options for families may allow them to navigate and determine the best educational placements for their child with ID within the public education system. However, Kramann and Biewer (2015) found that families of children with ID faced many barriers and challenges when they wanted to enroll their child in a particular school. For example, in an interview of a mother who has two children, one child with ID and another child without a disability, researchers reported that while the child without disability was easily placed into a regular neighborhood school, the mother had difficulty enrolling her child with ID in the same school. The mother ultimately had to seek other school options for her child with ID.

Kramann and Biewer (2015) further indicated that alternative schools might be appealing to the families of students with ID because these schools offer innovative curricula, specialized instruction, affordable therapies, and networks and support for the child and families.

An examination of students with ID's enrollment in different educational settings is an important research topic in terms of examining access to equal education opportunities. Regular classrooms within traditional neighborhood schools are accepted as the least restrictive environment (LRE) for students with ID. However, according to the U.S. Department of Education (2015), only 17% of all students with ID are educated in regular classrooms for 80% or more of the day along with their peers without disabilities. Nearly half of all students with ID are educated in self-contained special education classrooms (Kleinert et al. 2015; Morningstar, Kurth, & Johnson, 2017). Moreover, about a 15% of all students with ID are educated in separate or special schools (Kleinert et al. 2015).

Understanding enrollment trends and patterns is important because different placements may lead to different academic and behavior outcomes for students with ID and this may impact their future achievement. For example, de Graaf, van Hove, and Haveman (2013) as well as de Graaf and van Hove (2015) found evidence of the impact of school placement on students with ID's reading outcomes. These researchers examined the reading outcome differences of students with Down syndrome who were placed in general schools and separate special education schools in the Netherlands. The researchers interviewed parents of students with Down syndrome about their child's school history, academic and nonacademic performance, IQ, and school placement. Results from regression tests revealed that students with Down syndrome who spent more years in general schools had significantly higher parent-reported reading skill compared to students who were placed in special education schools during the same time.

Researchers have also documented this issue by examining the school outcomes of students with ID across general and self-contained classrooms. For example, Ryndak, Ward, Alper, Montgomery, and Stroch (2010) reported that students with ID had better literacy, independent living, and social and emotional skills in general classrooms compared to students with ID who were placed in self-contained classrooms. Wehmeyer, Lattin, Lapp-Rincker, and Agran, (2003) found that students' engagement with content standards and the general curriculum improved when they were placed in general settings but students who were placed in self-contained settings had lessen opportunities to engage with content standards and the general curriculum. Moreover, general education classrooms offered more access to goal-oriented instruction, age-appropriate resources, and general education content to students with ID (Matzen, Ryndak, & Nakao, 2010).

These varying outcomes of students with ID who are placed in different settings offers a rationale for conducting further research to examine their enrollment in different school types and how enrollment in these schools relates to their academic and behavior outcomes. Morningstar et al. (2017) said "given the vulnerability of students with significant disabilities for separate placements that may not provide the intended intensity of specialized educational experiences, systematically examining the influence of educational placement is necessary and appropriate" (pp. 8-9). Raywid's (1994) framework continues to be helpful for examining enrollment of students with ID across different school types including traditional and alternative schools and whether the school type that students with ID attend has any predictive value on their academic and behavior outcomes. Using the same framework, Perzigian et al. (2017) examined student enrollment distribution across traditional and alternative schools in one Midwestern urban school district. The researchers found that students with ID were more likely

to attend traditional and innovative schools and less likely to attend remediation-focused alternative schools. Taking this recent finding into account, the current study includes a sample of students with ID attending traditional and innovative schools. Analyses test whether enrollment in one of these schools (i.e., traditional vs. innovative) has a significant relationship with students' middle and high school outcomes. The middle school outcome is 8th grade reading achievement and the four high school outcomes are attendance, credits earned, ODRs and suspensions.

Conclusion

Federal laws set the stage for increasing expectations for students with ID as well as the quality of reading instruction provided to these students. Students with ID's participation in accountability systems via statewide general or alternate assessments has led researchers to develop more effective reading interventions targeting students' early reading skill. Researchers have found that early reading skill has been a predictor of later academic and behavior outcomes for students in general. Nevertheless, this topic is yet to be explored for students with ID. Additionally, this literature review suggests that ethnicity/race and enrollment in different school types may beget different educational experiences for students. Placement in alternative schools may yield different school outcomes for students compared to their counterparts who remain in traditional schools. Yet, researchers have not studied this topic for students with ID. This study is proposed as a contribution to address these gaps in the literature. The next chapter includes a description of the methodology that is used to answer the following four research questions:

1. Is there a relationship between 5th grade statewide standardized reading assessment (WKCE and WAA) results of students with ID and their 8th grade results on the same assessments?

2. Is there a relationship between 5th grade reading results of students with ID on the WKCE and WAA assessments and the following secondary outcomes?
    a. Number of days in attendance during secondary school in one academic year;
    b. Number of credits earned in one semester of secondary school;
    c. Number of ODRs in one secondary school academic year;
    d. Number of secondary school suspensions received in one academic year.
3. Do students with ID's middle and high school outcomes (i.e., 8th grade reading, secondary attendance, credits earned, ODRs, and suspensions received) and/or their relationship to 5th grade reading vary significantly by ethnicity/race?
4. Do students with ID's middle and high school outcomes (i.e., 8th grade reading, secondary attendance, credits earned, ODRs, and suspensions received) and/or their relationship to 5th grade reading vary significantly by school type?

CHAPTER 3

METHODOLOGY

This study's first aim was to examine the relationship between students with ID's 5th grade reading results on statewide general and alternate reading assessments and their 8th grade reading results on the same assessments. As a second aim, I tested the predictive impact of 5th grade reading results on statewide general and alternate reading assessments on students with ID's secondary academic and behavior outcomes. These secondary outcomes included: (a) days of attendance during one school year, (b) number of credits earned during one semester, (c) number of ODRs received during one school year, and (d) number of suspensions received during one school year. This study's third aim was to explore whether the students' middle and high school outcomes varied by their ethnicity/race (i.e., White vs. non-White). Lastly, I tested whether school type (i.e., traditional vs. innovative) that students with ID attended in middle and high school predicted academic and behavior outcomes. What follows is a description of the study's methodology, including a description of the participating school district, data source and sample, school coding procedures, reliability and validity of the alternate assessments upon which this study relied, and analytical approaches that were followed in the analyses.

Participating School District

I used a longitudinal dataset from an LEA located in an urban city in the state of Wisconsin. Nearly 600,000 people lived in this city. The city's ethnic composition was as follows: 40% Black, 38% White (non-Hispanic), 17% Hispanic/Latino, and 5% others. The LEA serves about 75,000 students in more than 150 K-12 schools annually. According to the state education agency (SEA) school enrollment report, students who were Black, Hispanic or Latino, White, and Asian made up 56%, 24%, 14% and 6% of the total student population in the district

respectively. The LEA predominantly serves students who live at or near the poverty line; with nearly 80% of the students qualifying for free or reduced price meals (FRM). Students' average performance on the statewide general reading assessments were lower when compared with scores of students in other similar districts in the same state.

Data Source and Sample

Data for the study were a subset of data from the Alternative Schools Research Project at University of Wisconsin-Madison (see Wilkerson, Afacan, Perzigian et al., 2016). The Institutional Review Board (IRB) at the University of Wisconsin-Madison approved the larger study in 2013. I completed the Collaborative Institutional Training Initiative (CITI) training that is required for researchers who work with human subjects in their studies. LEA permission to analyze and disseminate the findings of the current project was also granted.

The original longitudinal dataset included de-identified information for over 21,000 students who attended secondary schools in the participating district during the 2012-2013 academic year. The research team obtained the following three different data files from the LEA: Demographic (e.g., gender, ethnicity, free/reduced lunch [FRL] status, English language learner [ELL] status), academic (i.e., reading, credits earned, attendance), and behavior data (i.e., ODRs, suspensions, and expulsions). These three files were merged in SPSS 20, using each student's de-identified student identification number as the key variable. If students had missing demographic and/or outcome data, they were excluded from the dataset.

In the original 2012-13 school year data, 771 students were identified with ID. The data merging process, described above, reduced the sample to 400 students for whom demographic and outcome data were available in the dataset. Thus, this study focused on a cross-sectional sample of 400 students (including 9^{th}, 10^{th}, 11^{th}, and 12^{th} graders). All 400 students received

special education services under the ID category and were enrolled in a secondary school in the 2012-2013 school year. As shown in Table 1, Black students were overrepresented in this study's sample (69.3%). National statistics also show that Black students were disproportionately placed in the ID category (risk ratio = 2.22; U.S. Department of Education, 2016). In the state of Wisconsin, Sullivan and Bal (2013) reported that Black students were 2.49 times more likely to be identified with ID compared to their White counterparts in one diverse urban school district.

Table 1

Characteristics of the Study Sample and District

Characteristics	Sample (*N*=400)	District
Gender		
Male	61.5% (246)	51.6%
Female	38.5% (154)	48.4%
Race/Ethnicity		
Black	69.3% (277)	55.4%
Hispanic	14.5% (58)	24.0%
White	12.5% (50)	13.9%
Asian	3.5% (14)	5.5%
FRM status (yes)	82.5% (330)	82.3%
Grade Level		
9th Grade	28.2% (113)	34.3%
10th Grade	21.8% (87)	22.3%
11th Grade	25.0% (100)	24.3%
12th Grade	25.0% (100)	19.1%
High School Type		
Traditional	42.3% (169)	40.0%
Innovative	57.8% (231)	52.9%
5th Grade WAA		
Traditional	46.5% (114)	N/A
Innovative	53.4% (131)	N/A
5th grade WKCE		
Traditional	35.4% (55)	N/A
Innovative	64.6% (100)	N/A

Note. FRM= Free or reduced price meals; WAA = Wisconsin Alternate Assessment; WKCE = Wisconsin Knowledge and Concepts Exam; District data is retrieved from Wisconsin Department of Public Instruction; N/A= Not available.

Of those 400 students, 245 took the WAA and 155 took the WKCE reading assessments in their 5th grade year. The following data for that subset of students were analyzed: (a) 5th grade reading results based on statewide WKCE and WAA assessments, (b) 8th grade reading results based on statewide WKCE and WAA assessments, (c) number of secondary attendance days during the 2012-13 school year, (d) number of secondary credits earned during the Fall 2012 semester, (e) number of ODRs received during the 2012-13 school year, and (f) number of suspensions received during the 2012-13 school year. Next, I describe the process used to identify traditional and innovative alternative schools in the same district.

Identification of Alternative Schools in the District

In addition to demographic and outcome data**,** the dataset also included the schools that students with ID attended in 5th grade, 8th grade, and high school. Our research team coded all schools based on their types (e.g., traditional or alternative). To identify the school type that each student attended, we followed a school coding procedure based on a researcher-developed school coding protocol. (See Appendix A and Appendix B).

Training. The school coding procedure included a coding training that was provided by the principal investigator of the larger research project. I, along with other three research team members, participated in the school coding training. First, we identified all schools in the LEA's website and randomly selected five schools for training purposes. Second, the trainer demonstrated how each school should be coded using the school coding protocol and school information that were publicly available in the LEA's school district website. Third, the trainer randomly picked ten schools for the coders to code. After these ten schools were coded, coding results were compared with the trainer's results at a following meeting. The training phase continued until coders reached 100% agreement with the trainer.

Coding. The coding protocol includes four questions: (1) Is the school listed as alternative, charter, contract, transformative, intensive, or some category other than Middle/High School on the district website? (2) Do the majority of enrolled students at this school attend as a choice or were they assigned/referred there?; (3) Is the school focused on a particular skill area (e.g., arts, technology, language) or a specific student population identified as "at-risk"?; and (4) Is the school aimed at academic/credit behavior modification? Answers provided to these four questions helped to determine a final school type among four available options, based on Raywid's (1994) framework: *traditional*, *innovative* (Type 1), *behavior-focused alternative* (Type 2), and *academic remediation-focused alternative* (Type 3).

For the purpose of this study, I only included students with ID who were enrolled secondary schools in 2012-13 that were coded as either traditional or innovative. This was because a higher percentage of students with ID attended these two school types compared with behavior-focused and academic remediation-focused alternative schools (Perzigian et al., 2017). We also coded 114 elementary and middle schools in the LEA. A summary of the school coding results is presented in Table 2.

Table 2

School Coding Results

High School			Elementary and Middle		
School type	Number of schools	Average enrollment	School type	Number of schools	Average enrollment
Traditional	9 (17.0%)	942	Traditional	68 (59.6%)	455
Innovative	20 (37.7%)	560	Innovative	45 (39.5%)	490
BF	9 (17.0%)	18	BF	1 (.9%)	29
ARF	15 (28.3%)	88	ARF	0 (0%)	-
Total	53 (100%)		Total	114 (100%)	

Note. Number of schools = number of schools identified as each school type within the sample district; BF = Behavior-focused alternative school; ARF = Academic remediation-focused alternative school.

Schools that were coded as *traditional* were identified as comprehensive, regular schools; they served a majority of students who attended by choice; they did not target any particular student demographic or specific skill area; and they did not focus on academic or behavior remediation. Schools coded as *innovative* were: identified as alternative; served a majority of students who attended by choice; targeted specific skill areas, and did not focus on academic or behavior remediation. The following innovative school types were identified in the dataset: Technology, college preparation, community-based school, Montessori, arts (i.e., creative writing, dance, theater, music, and visual arts), language immersion, international baccalaureate, and urban agriculture.

In the dataset, only 9 students with ID were identified as attending a remediation type of schools (e.g., behavior or academic remediation-focused). These 9 students were not included in this study's sample. Of the 400 students with ID in the sample, 245 students took the WAA in the 5th grade (114 in traditional schools; 131 in innovative alternative schools). The number of students who took the WKCE in 5th grade was 155 (55 in traditional schools and 100 in innovative alternative).

Coding reliability results. A second researcher who also coded all schools in the LEA assessed coding accuracy. We calculated a reliability percentage by comparing the second coder's results with my results on an item-by-item basis. Results showed that the second coder and I coded all 53 secondary schools with 89% accuracy. We discussed disagreements and resolved them so that we reached 100% agreement.

The second coder and I also coded 114 elementary and middle schools in the LEA. We applied the same process for checking the reliability of school coding for the elementary and middle schools. We initially coded the 114 elementary and middle schools with 91% reliability.

We discussed discrepancies in person until 100% agreement on the final school codes was reached. To verify the coding accuracy, the principal investigator of the larger research project met with the LEA's alternative school director. The director reviewed the coding results and concurred with the researchers' final school codes.

Outcome Variables Required for Analyses

The following student-level data were supplied by the participating LEA and included in this study as outcome variables: (a) 8th grade reading results from the statewide WKCE and WAA assessments; (b) number of days attended for the 2012-13 academic year; (c) number of credits earned in the Fall 2012 semester; (d) number of ODRs received; and (e) number of suspensions received in the 2012-2013 school year. Next, I provide operational definitions of variables that were required for the analyses, which are also summarized in Appendix C.

WKCE 8th grade reading score. WKCE 8th grade reading score is a continuous variable that was used as an academic outcome in this study. WKCE reading scores could also be used to categorize students into four reading proficiency levels. The four categories representing proficiency levels for the WKCE 8th grade reading assessment were: (a) advanced, (b) proficient, (c) basic, and (d) minimal. The following cut scores were used to place students into these categories respectively: 790-539, 538-480, 479-445, and 444-330. Definitions of WKCE proficiency levels are described in Appendix D.

WAA 8th grade reading proficiency level. WAA 8th grade reading proficiency level is a categorical variable with four ordered categories that were used as an academic outcome. The four categories representing proficiency levels on the WAA 8th grade reading assessment are: (a) advanced, (b) proficient, (c) basic, and (d) minimal. The following cut scores were used to place

students into these categories respectively: 30-27, 26-20, 19-9, and 8-0. Definitions of WAA proficiency levels are also described in Appendix D.

Number of attendance days. Secondary attendance days was a continuous variable that was used as an academic outcome. The LEA counted each day that a student was present for at least 80% of the day as a "day present". This variable was comprised of the number of days that each student in the sample was present during the 2012-2013 school year. This variable could take a value ranging from 0 (no attendance) to 175 (maximum possible attendance).

Number of credits earned. Number of secondary credits earned in one semester was used as another academic outcome. The LEA provided credit data at the end of the Fall semester of the 2012-2013 school year. Thus, I used one semester data for credits but I used whole academic year data for other variables. Number of secondary credits earned was a continuous variable indicating how many credits each student earned in the Fall semester of the 2012-2013 school year. Students could earn .5 credits per class and a typical schedule was 6-7 courses per semester. This means that students must earn a minimum of 3.0 credits per semester to be on track to be able to graduate in four years. It should be noted that students could earn more credits based on their course schedules in a specific semester.

Number of ODRs received. Number of secondary ODRs received was a count variable that was used as a behavior outcome. ODRs received were reported for each student as a yearlong cumulative total number. This variable could take a value ranging from 0 (no ODRs received) to multiple ODRs that students received during the 2012-2013 school year.

Number of suspensions received. Number of secondary suspensions received was also used as a behavior outcome. This count variable was reported for each student as a yearlong

cumulative total number. This variable could take a value ranging from 0 (no suspensions) to multiple suspensions that students received during the 2012-2013 school year.

Predictor Variables Required for Analyses

WKCE 5th grade reading score. Just as I described for WKCE 8th grade scores above, WKCE 5th grade reading score was a continuous variable that was used as a predictor in this study. WKCE reading assessment scores could also be categorized into four performance levels (Appendix D). WKCE proficiency levels in reading were defined as following: (a) advanced, (b) proficient, (c) basic, and (d) minimal.

WAA 5th grade reading proficiency level. WAA 5th grade reading proficiency level was a categorical variable with four ordered categories and were used as a predictor in this study. The alternate assessment results were interpreted based on the four performance levels: Advanced, proficient, basic, and minimal (Appendix D). Alternate assessment results were used to evaluate how students with significant ID performed on the alternate assessment against grade-level expectations established by Wisconsin educators (WDPI, 2014). The following cut scores were used to place students into the four categories respectively: 30-27, 26-20, 19-8, and 7-0.

Ethnicity/Race. Ethnicity/race was a binary predictor indicating students with ID's ethnicity/race information: Non-White (0) and White (1).

School type. School type was a binary predictor indicating the type of middle and high school that students with ID attended: traditional (0) or innovative (1). It was used as a predictor variable in the analysis of middle and high school academic and behavior outcomes. Middle school type was used to predict 8th grade reading outcome and high school type was used to predict high school academic and behavior outcomes.

Missing Data

As described in the data source section, students who had missing demographic and/or outcome data were excluded from the sample. Thus, this study's sample (*N*= 400 students with ID) only includes students with complete data. However, Farley, Anderson, Irvin, and Tindal (2016) reported that a number of students with ID in their study switched between test types during different testing years (e.g., taking the regular statewide standardized assessment in 5th grade but switching to alternate assessment in 8th grade or vice versa). I took this recent finding into account and checked whether test switching was an issue in my sample. I identified 48 students who initially took the WKCE at 5th grade but switched to the WAA at 8th grade. I also identified 22 students who took the WAA at 5th grade but switched to the WKCE at 8th grade. To obtain a stable sample of students, I excluded these 70 students from the sample in the analyses of 5th grade reading results as a predictor of 8th grade reading results. Among the remaining students, 223 took the WAA and 107 took the WKCE both in 5th and 8th grades. However, I still kept all 400 students in the analysis of the predictive value of 5th grade reading results for high school outcomes because switching test types was not an issue for these analyses. Demographic characteristics of the 70 students who were excluded from the sample are presented in Table 3. I compared demographic characteristics of students who switched tests versus students who did not switched tests for significant difference using a Chi-square test of independence at the .05 level. According to the Chi-square test results, gender, ethnicity/race, and FRM status between two groups did not differ significantly: χ^2 (1, N=400)= 0.08, p= .77; χ^2 (3, N=400)= 2.47, p= .47; and χ^2 (1, N=400)= 1.26, p= .26 respectively.

Table 3

Demographic Characteristics of the Group Who Switched Tests vs. the Group Who Did Not

Characteristics	Students who switched tests (n=70)	Students who did not switch tests (n=330)
Gender		
Male	60.0% (42)	61.8% (204)
Female	40.0% (28)	38.2% (126)
Race/Ethnicity		
Black	74.2% (52)	68.3% (225)
Hispanic	15.7% (11)	14.5% (47)
White	8.5% (6)	13.3% (44)
Asian	1.4% (1)	3.9% (13)
FRM status (yes)	87.1% (61)	81.5% (269)

Note. FRM= Free or reduced price meals.

Reliability and Validity of WAA Assessment Results

Research findings. In the state of Wisconsin**,** researchers as well as the WDPI provided evidence for the reliability and validity of the WAA. Roach, Elliott, and Webb (2005) examined whether the WAA adequately measures the skills and concepts represented in Wisconsin's Model Academic Standards (WMAS). A panel of professionals examined the WAA assessments based on (a) the depth of knowledge level of each objective in the academic standards, (b) categorical concurrence, (c) range of knowledge, and (d) balance of representation. Roach et al. concluded that performance on the WAA rating scale constituted a valid index of achievement for the concepts and knowledge represented in WMAS.

The state's technical report on reliability. Another source of information for reliability and validity of the WAA can be obtained from the state's technical report (WDPI, 2015). The state reported item-specific reliability, which is one type of internal consistency measure, based on biserial values. For the WAA, item-specific reliability ranged from 0.18 (grade 10) to 0.79 (grades 4-8), which suggested an acceptable item-specific reliability.

Total-test reliability was another measure of reliability that was reported in the state's technical report. It measured the level of consistency of performance on all test questions in a given form, how well the questions measured the content domain and continue to measure over repeated administrations. Total-test reliabilities were measured by using Cronbach's alpha. Relatively high total-test reliability was reported for the WAA (0.96 for all grade levels). The standard error of measurement (SEM) was also reported as another measure of reliability. According to the technical report, the SEM values ranged from 1.96 (grade 4) to 2.15 (grade 10).

Validity. Validity refers to "the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests. Validity is, therefore, the most fundamental consideration in developing and evaluating tests" (WDPI, 2015, p.18). The state's technical report stated that a review committee established content validity by contributing to the item review and approval process and ensuring the items assessed the content standards. The review committee also ensured fair and unbiased items that functioned similarly for participants from different ethnic, gender, and disability backgrounds. High internal consistency, as described previously, was another evidence of validity. Also, characteristics of students participating in the WAA showed that the test was administered to a well-targeted population (i.e., students with significant ID), which also increased the validity of the assessments.

Data Analyses

A priori power analysis. I used G*Power (Faul, Erdfelder, Buchner, &, Lang, 2009) to conduct a priori power analysis of multiple regression. The sample size was investigated when medium effect size (f^2=. 15) with α=. 05 and power (1- β) =. 80 were assumed. With seven predictors (maximum number of predictors), 103 students were needed to achieve the 80%

probability to detect a medium sized effect when employing the traditional .05 criterion of statistical significance. Sufficient sample sizes were guaranteed in all of the following analyses.

Screening for outliers. I computed Cook's distances to detect outliers for each regression model. Outliers were identified if Cook's distance values exceeded the cutoff point of 1 (Cook, 1977; Stevens, 1984). No outliers were detected according to Cook's distance.

Regression analyses. I conducted separate regression tests for students who took the WKCE and the WAA. Regression tests were run using the statistical software SPSS 22 – and STATA 14 when needed. Different regression models were adopted according to the type of dependent variables. For the continuous variables, such as reading score, linear regression was conducted and the normality assumption was examined by P-P plot. The variance inflation factor (VIF) was applied to examine multicollinearity. The multicollinearity was considered high when VIF was greater than 10. When interaction was tested, the variables were centered to obtain a stable and reliable result (Robinson & Schumacker, 2009). Adequate transformation was applied to satisfy the normality assumption if it was violated.

When count variables, such as ODRs and suspensions, were modeled, I picked one model from Poisson, negative binomial, and zero-inflated Poisson regressions according to Akaike information criteria (AIC) and Bayesian information criteria (BIC). The three regressions have different distribution assumptions. The negative binomial regression can be used to model the over-dispersed count data that is present when the conditional variance exceeds the conditional mean (Coxe, West, & Aiken, 2009). In contrast, the ZIP regression can be used to model the over-dispersed count data caused by excess zero-count data. Both model the count variable with more parameters and less restrictive assumptions than Poisson regression; thus, both ZIP and negative binomial produce a better model fit and precise estimation as compared to a Poisson

model when the distribution assumption is violated. AIC and BIC information were used to evaluate which distribution assumption fitted the data best. When AIC and BIC suggested different models, the suggestion of BIC was followed since it was commonly recommended (Acquah, 2010; Wang & Liu, 2006). Next, I provide a description of the data analysis techniques that were used to answer this study's four research questions along with the specific hypotheses.

Research Question 1: Is there a relationship between 5th grade statewide standardized reading assessment (WKCE and WAA) results of students with ID and their 8th grade results on the same assessments?

For analysis of WKCE reading scores, I used simple linear regression to test if there was a significant relationship between 5th grade and 8th grade WKCE reading scores. Figure 1 shows that the normality assumption was generally met. VIF result was 1.00. My initial hypothesis was that students with ID's 5th grade WKCE reading score would significantly and positively predict their 8th grade reading score

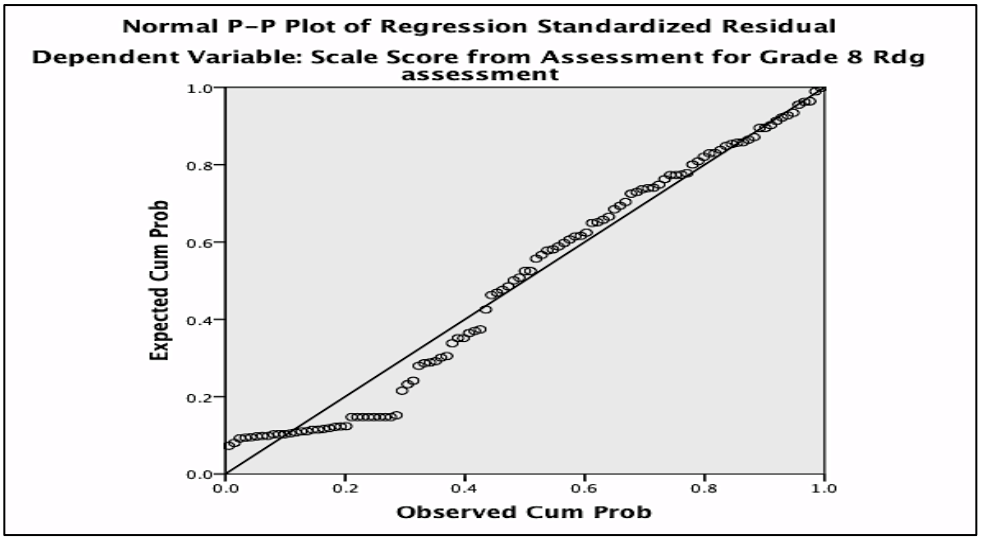

Figure 1. P-P plot of regression standardized residuals.

For analysis of WAA reading results, I used ordinal regression to test the relationship between 5th grade WAA reading results and 8th grade WAA reading results. The dependent variable was measured on an ordinal level that indicated students' 8th grade reading proficiency levels (i.e., minimal, basic, proficient, advanced). The predictor variable was coded as a series of dummy variables representing the order of the levels and was used to compare the adjacent proficiency levels (Walter, Feinstein, & Wells, 1987). Table 4 shows an example of this coding scheme. My initial hypothesis was that students' 5th grade WAA reading level would significantly and positively predict their 8th grade WAA reading level.

Table 4

Coding Scheme for Ordinal Predictor Variables

Rank	WAA Basic	WAA Proficient	WAA Advanced
1	0	0	0
2	1	0	0
3	1	1	0
4	1	1	1

Note. WAA= Wisconsin Alternate Assessment. Rank 1 indicates the lowest reading proficiency level (i.e., WAA minimal) and 4 indicates the highest reading proficiency level (i.e., WAA advanced).

Research Question 2: Is there a relationship between 5th grade reading results of students with ID on the WKCE and WAA assessments and the following four secondary student outcome variables: attendance, credits earned, ODRs, and suspensions received?

Number of days in attendance during secondary school in one academic year. I used simple linear regression to test the relationship between the students' 5th grade WKCE reading score and number of days of secondary attendance. As the left P-P plot in Figure 2 shows, the normality assumption was mildly violated. The data was left-skewed; thus, I computed the absence days (176 - attendance days), which was right-skewed, and applied the $\log_{10}$ transformation. The $\log_{10}$ is a commonly used method that transforms right-skewed data to

normally distributed data (McDonald, 2009). This transformation was applied to all the analyses regarding attendance days. As the right P-P plot in Figure 2 shows, the normality assumption was generally satisfied after the transformation. VIF result was 1.00. My initial hypothesis was that the students' 5th grade reading score would significantly and positively predict their secondary attendance.

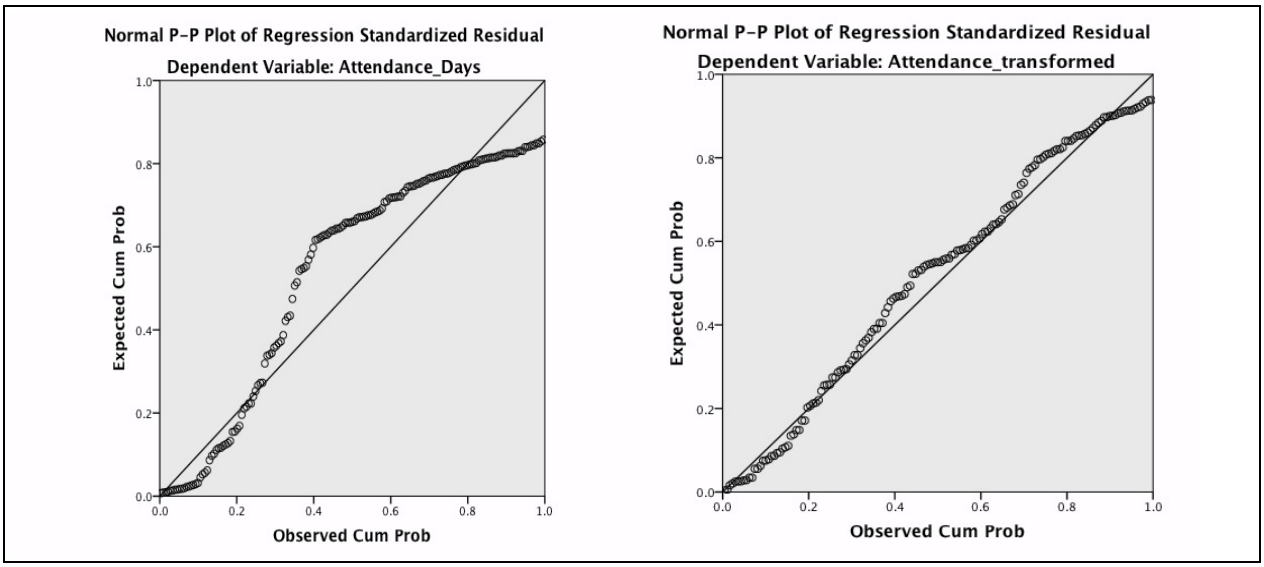

Figure 2. P-P plots of regression standardized residuals before (left) and after (right) transformation.

As the left P-P plot in Figure 3 shows, the normality assumption was mildly violated in testing whether 5th grade WAA reading result predicted number of days of secondary attendance. However, as the right P-P plot in Figure 3 illustrates, it was generally satisfied when analyzing absence days with the $\log_{10}$ transformation. VIF results were Basic= 1.35, Proficient= 1.54, and Advanced= 1.19. My initial hypothesis was that the students' 5th grade WAA reading result would significantly predict their secondary attendance (or absence) days.

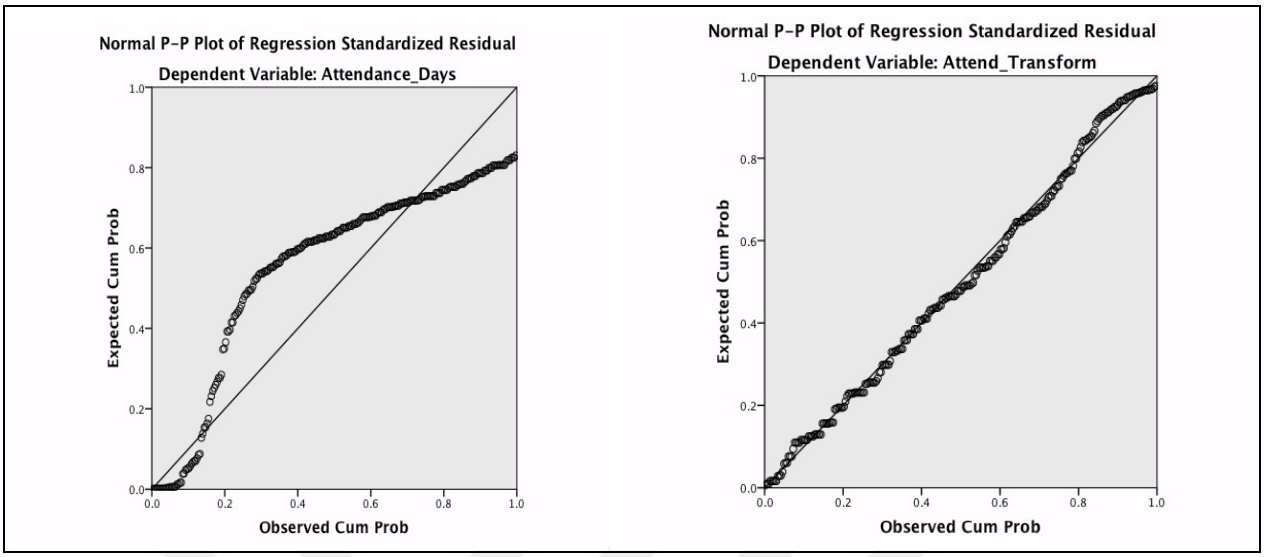

Figure 3. P-P plots of regression standardized residuals before (left) and after (right) transformation.

Number of credits earned, ODRs and suspensions received. Prior to testing the relationship between the students' 5th grade WKCE/WAA reading results and the three count outcome variables (i.e., number of credits earned, ODRs, and suspensions received), I first compared goodness of fit (GOF) statistics (i.e., AIC and BIC) of the three different count regression models to determine the most appropriate model for each. Table 5 presents GOF statistics. As can be seen in Table 5, the negative binomial regression model had the best fit across all regression tests; thus, results from this regression were reported. My initial hypothesis was that students with ID's 5th grade reading results would significantly predict higher credits earned in one secondary semester, lower ODRs, and lower suspensions received in one academic year.

Table 5

Goodness of Fit Statistics for Negative Binomial, Poisson, and Zero-inflated Poisson Regressions

Variable	GOF	Negative Binomial	Poisson	Zero-inflated Poisson
Credits Earned	AIC (WKCE)	1032.70	1313.55	**928.75**
	BIC (WKCE)	**1099.72**	1517.60	1254.75
	AIC (WAA)	1748.56	1683.29	**1407.65**
	BIC (WAA)	**1662.56**	1697.29	2156.65
ODRs	AIC (WKCE)	**629.07**	1097.58	863.44
	BIC (WKCE)	**635.16**	1103.67	1189.44
	AIC (WAA)	**721.51**	1183.04	835.05
	BIC (WAA)	**735.35**	1197.04	1584.05
Suspensions	AIC (WKCE)	355.46	418.52	**365.60**
	BIC (WKCE)	**361.54**	424.61	691.60
	AIC (WAA)	400.96	482.17	**373.47**
	BIC (WAA)	**414.96**	496.18	1122.47

Note. GOF= Goodness of fit; AIC= Akaike's Information Criterion; BIC= Bayesian Information Criterion; WKCE= Wisconsin Knowledge and Concepts Examination; WAA= Wisconsin Alternate Assessment; ODRs= Office discipline referrals.

Research Question 3: Do students with ID's middle and high school outcomes (i.e., 8th grade reading, secondary attendance, credits earned, ODRs, and suspensions received) and/or their relationship to 5th grade reading vary significantly by ethnicity/race?

I added a student ethnicity/race variable into the regression tests that were described above. My initial hypothesis was that White students would have higher 8th grade reading results, higher attendance (or lower absence), higher credits earned, lower ODRs, and lower suspensions compared to their non-White counterparts. I also tested whether 5th grade reading result and ethnicity/race interaction variable significantly predicted students' later outcomes.

5th grade reading and ethnicity/race predicting 8th grade reading. As Figure 4 shows, the normality assumption was generally met. Also, there was no multicollinearity after centering:

I centered the 5th grade reading score when computing the interaction term. VIF results were 1.02, 1.02, and 1.25 for 5th grade reading, ethnicity/race, and interaction predictors respectively.

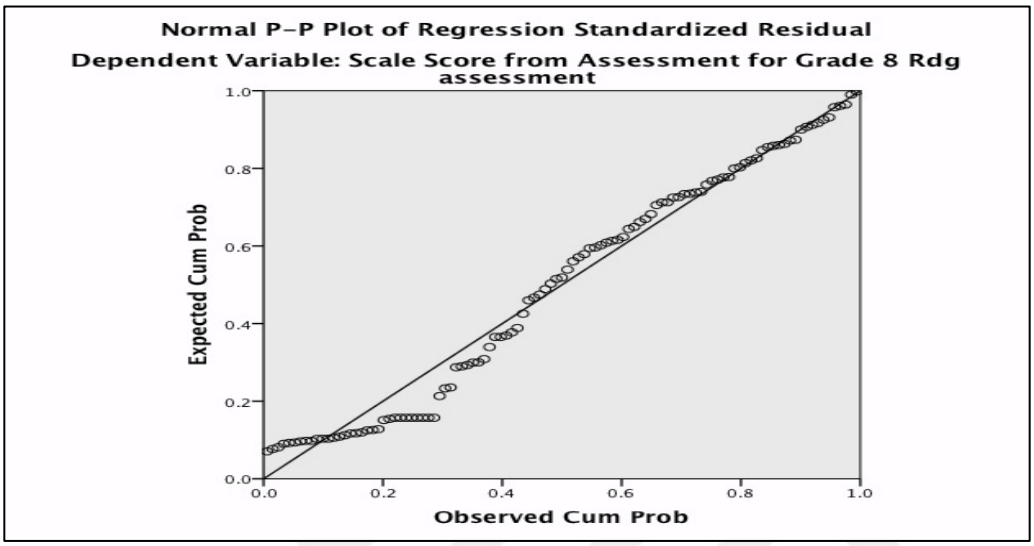

Figure 4. P-P plot of regression standardized residuals.

5th grade reading and ethnicity/race predicting attendance. As the left plot in Figure 5 shows, the normality assumption was mildly violated. However, as the right plot in Figure 5 displays, it was satisfied after the $\log_{10}$ transformation. VIF results were 1.10, 1.27, and 1.36 for 5th grade reading, ethnicity/race, and interaction predictors respectively. For WAA analysis, VIF results were 1.35, 1.54, 1.19, and 1.00 for basic, proficient, advanced, and ethnicity/race predictors respectively. For interaction predictors, VIF results were 6.84, 3.73, and 1.39 for basic x White, proficient x White, and advanced x White interactions. As the bottom P-P plot in Figure 5 shows, the normality assumption was satisfied in the analysis.

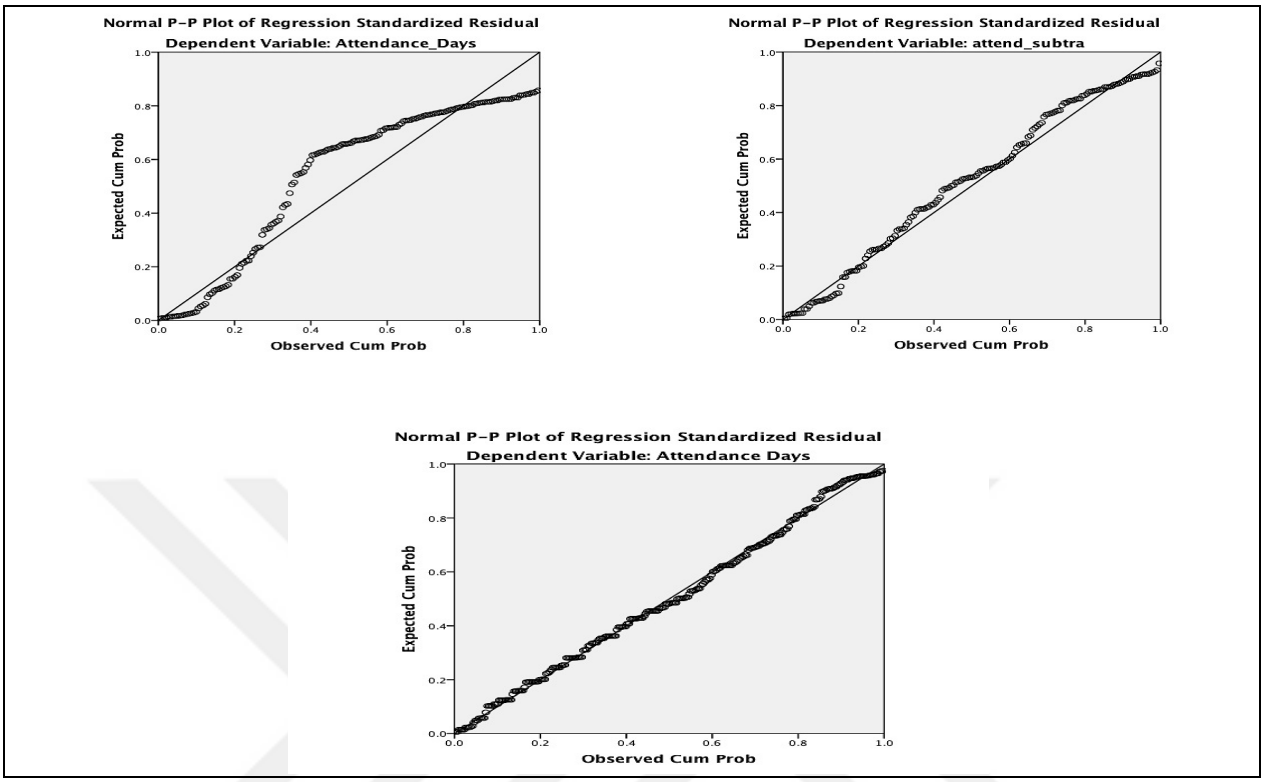

Figure 5. P-P plots of regression standardized residuals before (left) and after (right) transformation.

Table 8 reports GOF statistics for the three count regression models. I used negative binomial regression to test the predictive impact of 5th grade reading and ethnicity/race on credits earned and ODRs. I used ZIP in the analysis of 5th grade WAA reading and ethnicity/race predicting suspensions received because other two regression models (i.e., Negative Binomial and Poisson) could not converge which may be due to severely violated assumptions.

Table 6

Goodness of Fit Statistics for Negative Binomial, Poisson, and Zero-inflated Poisson Regressions

Variable	GOF	Negative Binomial	Poisson	Zero-inflated Poisson
Credits Earned	AIC (WKCE)	1036.95	1317.71	**932.52**
	BIC (WKCE)	**1048.86**	1329.62	1518.91
	AIC (WAA)	1755.32	1853.18	**1409.83**
	BIC (WAA)	**1783.33**	1881.51	3170
ODRs	AIC (WKCE)	**627.79**	1087.35	862.91
	BIC (WKCE)	**639.96**	1099.52	1518.91
	AIC (WAA)	**719.13**	1171.05	819.83
	BIC (WAA)	**747.14**	1199.06	2170.83
Suspensions	AIC (WKCE)	**357.35**	419.56	369.73
	BIC (WKCE)	**369.53**	431.74	1025.73

Note. GOF= Goodness of fit; AIC= Akaike's Information Criterion; BIC= Bayesian Information Criterion; WKCE= Wisconsin Knowledge and Concepts Examination; WAA= Wisconsin Alternate Assessment; ODRs= Office discipline referrals. AIC and BIC were not reported for non-converged models.

Research Question 4: Do students with ID's middle and high school outcomes (i.e., 8th grade reading, secondary attendance, credits earned, ODRs, and suspensions received) and/or their relationship to 5th grade reading vary significantly by school type?

The same regression analyses were conducted as were conducted for research questions one and two. However, for this research question I added school type into the regression tests. The purpose was to check whether middle or high school type (i.e., traditional vs. innovative) significantly predicted the students' middle and high school outcomes. My initial hypothesis was that students attending innovative schools would have higher 8th grade reading results, higher attendance (or lower absence), higher credits earned, lower ODRs, and lower suspensions compared to their counterparts attending traditional schools. The interaction of reading and school type was also tested**.**

5th grade reading and school type predicting 8th grade reading. As Figure 6 shows, the normality assumption was generally satisfied. VIF results were 1.63, 1.04, and 1.63 for 5th grade reading, middle school type, and interaction predictors respectively.

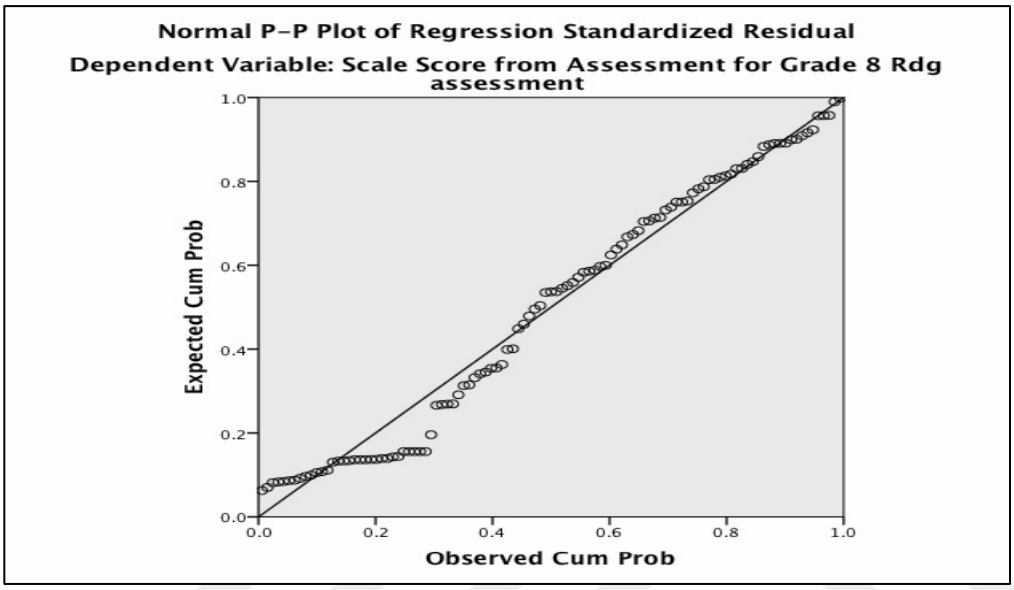

Figure 6. P-P plot of regression standardized residuals.

5th grade reading and school type predicting attendance. As the left P-P plot in Figure 7 shows, the normality assumption was mildly violated. However, as the right P-P plot in Figure 7 shows, it was generally met after the $\log_{10}$ transformation. VIF results were 3.02, 1.01, and 3.00 for 5th grade reading, school type, and interaction predictors respectively. For the WAA analysis, the normality assumption was satisfied as shown at the bottom P-P plot in Figure 7. VIF results were 1.40, 1.57, 1.19, and 1.01 for basic, proficient, advanced, and school type predictors, respectively. For interaction predictors, VIF results were 9.11, 5.36, and 3.01 for basic x innovative, proficient x innovative, and advanced x innovative respectively.

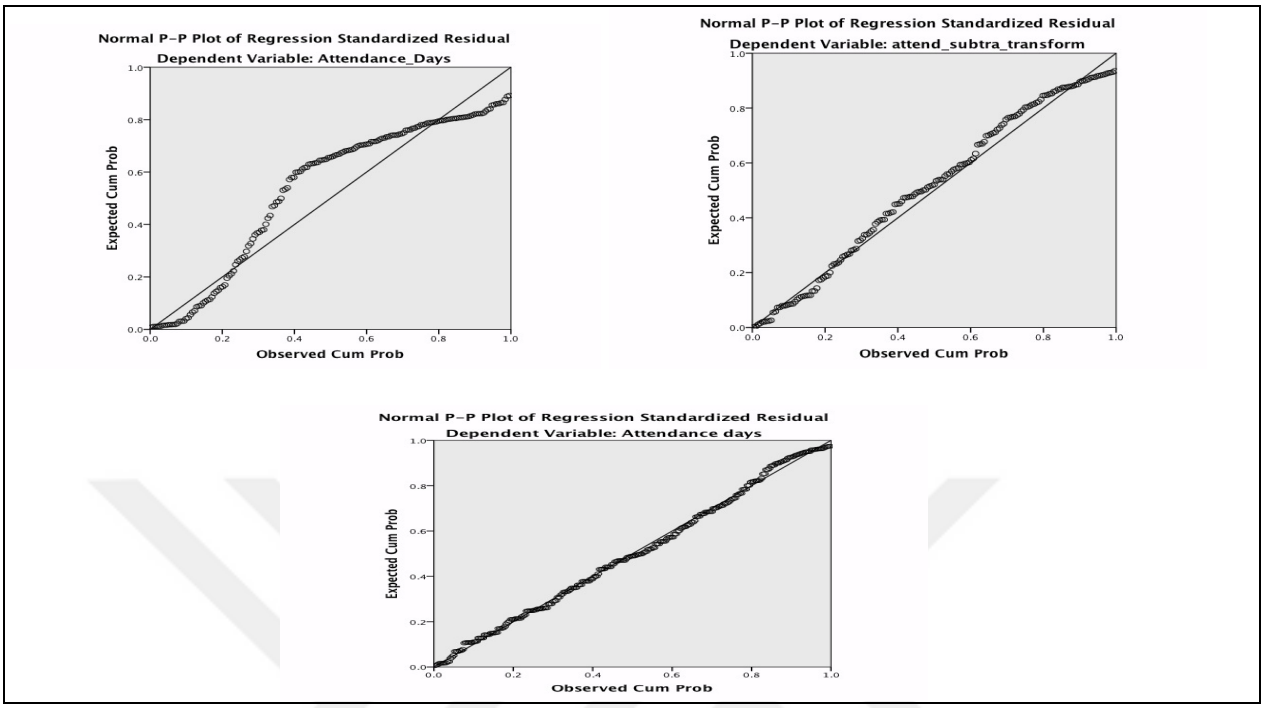

Figure 7. P-P plots of regression standardized residuals before (left) and after (right) transformation.

In the analyses of count outcomes, negative binomial regression was the fit best across all regression tests; thus, results from this regression test were reported. Table 7 shows the GOF statistics of the three count models.

Table 7

Goodness of Fit Statistics of Negative Binomial, Poisson, and Zero-inflated Poisson Regressions

Variable	GOF	Negative Binomial	Poisson	Zero-inflated Poisson
Credits Earned	AIC (WKCE)	1036.17	1311.81	**931.11**
	BIC (WKCE)	**1048.34**	1323.99	1587.11
	AIC (WAA)	1756.44	1875.21	**1412.94**
	BIC (WAA)	**1784.45**	1903.54	3173.94
ODRs	AIC (WKCE)	**631.02**	1095.90	861.77
	BIC (WKCE)	**643.20**	1108.08	1517.77
	AIC (WAA)	**714.36**	1160.45	824.08
	BIC (WAA)	**742.37**	1188.46	2585
Suspensions	AIC (WKCE)	**359.39**	440.42	369.51
	BIC (WKCE)	**371.56**	452.89	1025.51
	AIC (WAA)	399.99	477.83	**375.84**
	BIC (WAA)	**428.00**	505.84	2136

Note. GOF= Goodness of fit; AIC= Akaike's Information Criterion; BIC= Bayesian Information Criterion; WKCE= Wisconsin Knowledge and Concepts Examination; WAA= Wisconsin Alternate Assessment; ODRs= Office discipline referrals.

CHAPTER 4

RESULTS

In this chapter, I report the results of data analyses. I first present some descriptive statistics for the variables used in the analyses. I then answer the study's research questions.

Descriptive Statistics

WKCE. I report descriptive statistics separately for the students who took the WKCE and the students who took the WAA. Table 8 shows some descriptive statistics for the students who took the WKCE reading test both in 5th and 8th grades. The students' mean WKCE reading scores were 362.29 and 389.74 for 5th and 8th grades respectively. The mean number of days attended in one academic year of secondary school (i.e., attendance) was 129.61. On average, the students earned 2.41 credits in one semester of secondary school. The mean number of ODRs and suspensions received in one school year were 2.34 and 0.68 respectively.

Table 8

Summary of Variables for the WKCE Group

Variable	*n*	*Min*	*Max*	*Range*	*Mean*	*SD*
WKCE Reading 5	107	290	502	212	362.29	50.70
WKCE Reading 8	107	330	543	213	389.74	49.60
Attendance	155	9	175	166	129.61	45.77
Credits Earned	155	0	6.5	6.5	2.41	1.43
ODR	155	0	35	35	2.34	4.95
Suspension	155	0	8	8	.68	1.36

Note. WKCE= Wisconsin Knowledge and Concepts Examination; SD= Standard deviation; ODR= Office discipline referral; Min=Minimum; Max=Maximum.

In Table 9, I report the number and percentages of students within four WKCE reading proficiency levels. As the table shows, a majority of the students performed at *minimal* or *basic* reading levels both in 5th and 8th grades. Only 4% and 3% of the students performed at *proficient or above* reading levels in 5th and 8th grades respectively.

Table 9

Summary of Reading Proficiency Levels for the WKCE Group

Variable	*n*	*Minimal*	*Basic*	*Proficient*	*Advanced*
WKCE Reading 5	107	83 (77.6%)	20 (18.7%)	3 (2.8%)	1 (.9%)
WKCE Reading 8	107	92 (86.0%)	12 (11.2%)	2 (1.9%)	1 (.9%)

Note. WKCE= Wisconsin Knowledge and Concepts Examination.

WAA. For the students who took the WAA reading assessment both in 5th and 8th grades, Table 10 presents some descriptive statistics. As the table displays, students achieved reading scores across all proficiency levels. Nearly half of the students performed at *proficient or above* WAA reading levels. On the other hand, the remaining half of the students performed at *basic or below* reading levels both in 5th and 8th grades.

Table 10

Summary of Reading Proficiency Levels for the WAA Group

Variable	*n*	*Minimal*	*Basic*	*Proficient*	*Advanced*
WAA Reading 5	223	45 (20.2%)	69 (30.9%)	80 (35.9%)	29 (13.0%)
WAA Reading 8	223	36 (16.1%)	74 (33.2%)	68 (30.5%)	45 (20.2%)

Note. WAA= Wisconsin Alternate Assessment.

Table 11 presents additional descriptive statistics for the students who took the WAA. The students' mean number of days attended in one year of secondary school (i.e., attendance) was 145.03. On average, students earned 3.08 credits in one semester. The mean number of ODRs and suspensions received in one academic year were 1.20 and 0.40 respectively.

Table 11

Summary of Secondary Variables for the WAA Group

Variable	*n*	*Min*	*Max*	*Range*	*Mean*	*SD*
Attendance	245	6	175	169	145.03	39.15
Credits Earned	245	0	7	7	3.08	1.21
ODR	245	0	30	30	1.20	3.44
Suspension	245	0	7	7	.40	1.12

Note. WAA= Wisconsin Alternate Assessment; ODR= Office discipline referral; SD=Standard deviation; Min=Minimum; Max=Maximum.

In the remainder of this chapter I present results of data analyses for the study's research questions. Results are presented by research question.

Research Question 1: Is there a relationship between 5th grade statewide standardized reading assessment (WKCE and WAA) results of students with ID and their 8th grade results on the same assessments?

WKCE. Table 12 contains a summary of the results from a simple linear regression test. The regression was run to examine whether there was a correlation between 5th grade WKCE reading scores and the change in 8th grade WKCE reading scores. A non-significant relationship was found, $F_{(1, 105)}= 1.30$, $p=.256$. Results from the regression analysis showed that 5th grade WKCE reading score explained only 1.2% of the variance in 8th grade reading score. My initial hypothesis that students with ID's 5th grade WKCE reading scores would significantly predict their 8th grade WKCE reading scores was not supported.

Table 12

Summary of Simple Linear Regression Analysis for 5th Grade WKCE Reading Score Predicting 8th Grade WKCE Reading Score (n=107)

Predictor	*B*	*SE*	*β*	*95% CI*
5th grade reading	0.10	0.09	.11	[-0.08, 0.29]
R^2	.012			
$F_{(1, 105)}$	1.30			

Note. WKCE= Wisconsin Knowledge and Concepts Examination; SE= standard error; CI= Confidence interval.

WAA. An ordinal regression was run to examine whether a one level increase in 5th grade WAA reading proficiency level (e.g., going from *minimal* to *basic* or *basic* to *proficient*) resulted in an increase in the log odds of being in a higher 8th grade WAA reading proficiency level. The regression model fitted well (Deviance $\chi_3^2 = 8.244$, $p= .22$).

Table 13 provides a summary of results from the ordinal regression test. The 5th grade WAA reading result was a significant predictor ($\chi_3^2 = 129.78$) of 8th grade WAA reading result. The pseudo Nagelkerke R^2 was 0.47. For a one-unit increase in *basic* category (i.e., going from *minimal* to *basic*), the expected log odds of being in a higher level of reading proficiency increased by 2.75. This shows that the students in the *basic* category in 5th grade have a significantly higher probability of being in a higher reading proficiency category in 8th grade than students in the *minimal* category in 5th grade.

Similarly, for a one-unit increase in proficient category (i.e., going from *basic* to *proficient*), the expected log odds of being in a higher reading proficiency level increase by 1.76. Compared to students in the *basic* category in 5th grade, students in the *proficient* category had a significantly higher probability of being in a higher reading proficiency level in 8th grade. However, results did not suggest a significant difference for students who scored at the *advanced* level in 5th grade. Compared to students in the *proficient* reading category in 5th grade, students in the *advanced* reading category remained in the same category in 8th grade. My initial hypothesis that students' 5th grade WAA reading result would significantly predict their 8th grade WAA reading result was supported.

Table 13

Summary of Ordinal Regression Analysis for 5th Grade WAA Reading Proficiency Level Predicting 8th Grade WAA Reading Proficiency Level (n=223)

Predictors	*Estimate*	*SE*	*Wald*	*95% CI*
WAA_Basic	2.75***	0.45	36.59	[1.86, 3.64]
WAA_Proficient	1.76***	0.33	28.21	[1.11, 2.41]
WAA_Advanced	0.419	0.40	1.06	[-0.37, 1.21]
Likelihood ratio test χ_3^2	129.78***			
Pseudo Nagelkerke R^2	.47			

Note. ***p<. 001*;* WAA= Wisconsin Alternate Assessment*;* SE= standard error; CI= Confidence interval.

Table 14 presents the predicted probabilities for each proficiency level. Of the students who were at the *minimal* reading level in 5th grade: 63% had predicted performance at *minimal*, 34% *basic*, 3% *proficient*, and 1% *advanced* reading level in 8th grade assessment. Of the students who were at the *basic* reading level in 5th grade: 10% had predicted performance at *minimal*, 55% *basic*, 28% *proficient*, and 8% *advanced* reading level in 8th grade assessment. Of the students who were at the *proficient* reading level in 5th grade: 2% had predicted performance at *minimal*, 22% *basic*, 43% *proficient*, and 33% *advanced* reading level in 8th grade assessment. Lastly, of the students who were at the *advanced* reading level in 5th grade: 1% had predicted performance at *minimal*, 16% *basic*, 40% *proficient*, and 43% *advanced* reading level in 8th grade reading assessment.

Table 14

Estimated Response Probabilities for 8th Grade WAA Reading Result

5th grade WAA proficiency level	*Predicted probability for response category: 1 (Minimal)*	*Predicted probability for response category: 2 (Basic)*	*Predicted probability for response category: 3 (Proficient)*	*Predicted probability for response category: 4 (Advanced)*
Minimal	.63	.34	.03	.01
Basic	.10	.55	.28	.08
Proficient	.02	.22	.43	.33
Advanced	.01	.16	.40	.43

Note. WAA= Wisconsin Alternate Assessment.

Research Question 2: Is there a relationship between 5th grade reading results of students with ID on the WKCE and WAA assessments and the following secondary outcomes: (a) days of attendance, (b) credits earned in one semester, (c) number of ODRs received in one academic year, and (d) number of suspensions received in one academic year?

WKCE. Table 15 shows the results from a simple linear regression that was run to test the relationship between 5th grade WKCE reading score and the change in the number of secondary absence days. A non-significant relationship was found, $F_{(1, 153)}= 1.97$, $p=.16$. The

students' 5th grade WKCE reading score explained only 1.3% of secondary absence days (R^2=. *013*). My initial hypothesis that students' 5th grade WKCE reading score would significantly predict their secondary attendance (or absence) days was not supported.

Table 15

Summary of Simple Linear Regression Analysis for 5th Grade WKCE Reading Score Predicting Secondary Absence Days (n=155)

Predictor	*B*	*SE*	*β*	*95% CI*
5th grade reading	-0.001	0.001	-.113	[-0.003, 0.000]
R^2	.013			
$F_{(1, 153)}$	1.97			

Note. WKCE= Wisconsin Knowledge and Concepts Examination; CI= Confidence interval; SE= Standard Error.

Table 16 reports the results from three separate negative binomial regressions. The 5th grade WKCE reading test score was not a significant predictor of credits earned in one semester and suspensions received in one year. However, it was a statistically significant predictor for the outcome variable ODRs with coefficient -0.005. This means that for each one-unit increase on 5th grade WKCE reading score, the expected log count of secondary ODRs received decreased by 0.005. The percent change in the incident rate of ODRs was a 0.504% decrease for every unit increase in reading score (Exp(*B*)= 0.995). Overall, only my initial hypothesis that students' 5th grade WKCE reading score would significantly predict their secondary ODRs was supported.

Table 16

Summary of Negative Binomial Regression Analyses for 5th Grade WKCE Reading Score Predicting Secondary Credits Earned, ODRs, and Suspensions Received (n=155)

	Credits			*ODRs*			*Suspensions*		
Predictor	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*
5th grade reading	0.000	0.001	1.00	-0.005*	0.001	0.99	-.003	.002	0.99
Likelihood ratio test χ^2		0.029			7.09*			1.37	
df		1			1			1	

Note. * p<. 05; WKCE= Wisconsin Knowledge and Concepts Examination; ODRs= Office discipline referrals; df= Degrees of freedom; SE= Standard error.

WAA. A multiple regression test was used to examine the relationship between 5th grade WAA reading level and the change in the number of absence days. Table 17 shows the results from this analysis. A non-significant relationship was found, $F_{(3, 241)}$= 1.15, p=. 32. The 5th grade WAA reading result explained only 1.4% variance of secondary absence days (R^2=. *014*). My initial hypothesis that students' 5th grade WAA reading result would significantly predict their secondary attendance (or absence) days was not supported.

Table 17

Summary of Multiple Regression Analysis for 5th Grade WAA Reading Results Predicting Secondary Absence Days (n=245)

Predictors	*B*	*SE*	*β*	*95% CI*
WAA_Basic	-0.09	0.10	-.07	[-0.29, 0.09]
WAA_Proficient	0.11	0.08	.11	[-0.04, 0.27]
WAA_Advanced	0.06	0.09	.04	[-0.13, 0.25]
R^2	.014			
$F_{(3, 241)}$	1.15			

Note. WAA= Wisconsin Alternate Assessment; CI= Confidence interval; SE= Standard error.

Table 18 provides a summary of results from three separate negative binomial regression tests. The 5th grade WAA basic level had a coefficient of 0.92, which was statistically significant for ODRs. This means that for an increase from *minimal* to *basic* level, the expected log count of secondary ODRs received increased by 0.92. In other words, the students who scored in the *basic* category had 2.51 times greater number of ODRs compared to students who scored in the *minimal* level. Also, the 5th grade WAA *basic* level had a coefficient of 1.31, which was statistically significant for suspensions. This means that for an increase from the *minimal* to *basic* levels, the expected log count of secondary suspensions received increased by 1.31. In other words, these students had a 3.72 times greater number of suspensions compared to students who scored in the *minimal* level. The 5th grade WAA reading result was not a significant predictor of secondary credits earned in one semester. Overall, only the hypotheses that students'

5th grade WAA reading results would significantly predict their secondary ODRs and suspensions received were supported.

Table 18

Summary of Negative Binomial Regression Analyses for 5th Grade WAA Reading Score Predicting Secondary Credits Earned, ODRs, and Suspensions Received (n=245)

	Credits			*ODRs*			*Suspensions*		
Predictors	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*
WAA_Bas	0.02	0.20	1.09	0.92*	0.33	2.51	1.31*	0.57	3.72
WAA_Prof	-0.00	0.16	0.86	0.33	0.21	1.40	0.34	0.30	1.41
WAA_Adv	-0.01	0.19	0.98	0.44	0.23	1.56	0.33	0.31	1.39
Likelihood ratio test X^2	0.023			29.40***			17.45***		
df	3			3			3		

Note. *p<. 05; *** p<. 001; ODRs= Office discipline referrals; SE= Standard error; *df*= Degrees of freedom; WAA_Bas= Wisconsin Alternate Assessment Basic; WAA_Prof= Wisconsin Alternate Assessment Proficient; WAA_Adv= Wisconsin Alternate Assessment Advanced; WAA= Wisconsin Alternate Assessment.

Research Question 3: Do students with ID's middle and high school outcomes (i.e., 8th grade reading, secondary attendance, credits earned, ODRs, and suspensions received) and/or their relationship to 5th grade reading vary significantly by ethnicity/race?

WKCE x Ethnicity/Race. Table 19 reports the results from two separate multiple regressions. The regressions were run to examine whether the main effect of ethnicity/race and its interaction effect with 5th grade WKCE reading scores significantly predicted students' 8th grade reading scores. Neither the main effect of ethnicity/race nor its interaction with 5th grade reading score significantly predicted students' 8th grade reading score, $F_{(3, 103)}$= 0.69, p=. 55. Likewise, ethnicity/race and its interaction with 5th grade reading score did not significantly predict students' secondary attendance (absence) days, $F_{(3, 151)}$= 0.87, p=. 45. The hypotheses that White students with ID would have favorable 8th grade WKCE reading and secondary attendance (or absence) outcomes were not supported.

Table 19

Summary of Multiple Regression Analyses for 5th Grade WKCE Reading Score and Ethnicity/Race Predicting 8th Grade WKCE Reading Score and Secondary Absence Days

	8th grade reading				*Secondary absence days*			
Predictors	*B*	*SE*	*β*	*95% CI*	*B*	*SE*	*β*	*95% CI*
5th grade reading	-0.18	0.34	-.18	[-0.86, 0.50]	-0.00	0.00	-.10	[-0.03, 0.00]
White	-123.9	139.5	-.66	[-400, 152]	0.13	0.18	.06	[-0.23, 0.50]
5th grade reading x White	0.31	0.35	.66	[-0.40, 1.01]	-0.11	0.17	-.06	[-0.45, 0.22]
R^2		.020				.017		
F		0.696				0.874		
df		3				3		
n		107				155		

Note. WKCE= Wisconsin Knowledge and Concepts Examination; CI= Confidence interval; df= degrees of freedom; SE= Standard error. Non-White was the reference group.

Table 20 reports the results from three separate negative binomial regression tests. Results showed that ethnicity/race and its interaction with 5th grade reading score did not significantly predict students' secondary credits earned, ODRs, and suspensions received. Consistent with a prior finding, only 5th grade reading score was a significant predictor of secondary ODRs. Overall, the hypotheses that White students with ID would have favorable secondary credits earned in one semester, ODRs, and suspensions received were not supported.

Table 20

Summary of Negative Binomial Regression Analyses for 5th Grade WKCE Reading Score and Ethnicity/Race Predicting Secondary Credits Earned, ODRs, and Suspensions Received (n= 155)

	Credits			*ODRs*			*Suspensions*		
Predictors	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*
5th grade reading	0.000	0.001	1.00	-0.005*	0.002	0.99	-0.003	0.00	0.99
White	-0.24	2.91	0.78	-4.42	3.113	0.01	-7.050	5.60	0.00
5th grade reading x White	0.001	0.007	1.00	0.009	0.007	1.00	0.017	0.01	1.01
Likelihood ratio test X^2		0.04			12.38*			3.21	
df		3			3			3	

Note. *p<. 05; WKCE= Wisconsin Knowledge and Concepts Examination; ODRs= Office discipline referrals; SE= Standard error. Non-White was the reference group.

WAA. Table 21 reports the results from an ordinal regression test. The regression was run to test whether the main effect of ethnicity/race and its interaction with 5th grade WAA reading results significantly predicted students' 8th grade WAA reading result. The regression model fitted well (Deviance χ_7^2= 12.24, p= .58). The results showed that both ethnicity/race and its interaction with 5th grade WAA reading results did not significantly predict students' 8th grade WAA reading results. The hypothesis that White students with ID would have favorable 8th grade WAA reading results was not supported.

Table 21

Summary of Ordinal Regression Analysis for 5th Grade WAA Reading Proficiency Level and Ethnicity/Race Predicting 8th Grade WAA Reading Proficiency Level (n= 223)

Predictors	*Estimate*	*SE*	*Wald*	*95% CI*
WAA_Basic	2.75***	0.49	31.45	[1.79, 3.71]
WAA_Proficient	1.61***	0.35	20.83	[0.92, 2.31]
WAA_Advanced	0.51	0.43	1.39	[-0.34, 1.36]
White	-0.90	0.87	1.08	[-2.61, 0.80]
Basic x White	-0.06	1.12	0.00	[-2.72, 2.14]
Proficient x White	1.14	0.89	1.64	[-0.60, 2.89]
Advanced x White	-0.85	1.25	0.47	[-3.31, 1.59]
Likelihood ratio test χ_7^2	133.48***			
Pseudo Nagelkerke R^2	.483			

Note. ***p<. 001*;* WAA= Wisconsin Alternate Assessment*;* SE= standard error; CI= Confidence interval. Non-White was the reference group.

A multiple regression was run to test whether the main effect of ethnicity/race and its interaction with 5th grade WAA reading results predicted students' secondary absence days. A significant relationship was found on the main effect, $F_{(4, 240)}$= 2.41, p=. 049. As Table 22 shows, the main effect of ethnicity/race significantly predicted students' absence days ($t(250) = -2.47; p$=. 01). This means that the predicted number of absence days increased by 1.66 (i.e., $10^{0.22}$) for non-White students as compared with White students. My initial hypothesis that White students with ID would have favorable secondary attendance was supported for the WAA group.

Table 22

Summary of Multiple Regression Analysis for 5th Grade WAA Reading Results and Ethnicity/Race Predicting Secondary Absence Days (n=245)

Predictors	*B*	*SE*	*β*	*95% CI*
WAA_Basic	-0.11	0.09	-0.08	[-0.30, 0.08]
WAA_Proficient	0.12	0.08	0.11	[-0.03, 0.28]
WAA_Advanced	0.04	0.09	0.03	[-0.14, 0.24]
White	-0.22*	0.09	-0.15	[-0.40, -0.04]
Basic x White	-0.10	0.26	-0.06	[-0.62, 0.41]
Proficient x White	-0.30	0.23	-0.16	[-0.75, 0.14]
Advanced x White	-0.05	0.30	-0.01	[-0.65, 0.54]
R^2	.04			
$F_{(4, 240)}$	2.41*			

Note. *p<. 05; WAA= Wisconsin Alternate Assessment; SE=Standard error; CI= Confidence interval. Non-White was the reference group.

Table 23 reports the results from two separate negative binomial and one ZIP regressions. The main and interaction effects were not significant for credits earned and ODRs received. However, the main effect of ethnicity/race was significant for suspensions (B = -3.21; p=. 009). This means that the expected log count of suspensions received decreased by 3.21 for White students. Overall, only the hypothesis that White students with ID would have significantly lower secondary suspensions received was supported.

Table 23

Summary of Negative Binomial and ZIP Regressions for 5th Grade WAA Reading Result and Ethnicity/Race Predicting Secondary Credits Earned, ODRs, and Suspensions Received (n=245)

	Credits			*ODRs*			*Suspensions*+	
Predictors	*B*	*SE B*	*Exp (B)*	*B*	*SE B*	*Exp (B)*	*B*	*SE B*
WAA_Basic	0.03	0.22	1.03	1.07*	0.37	2.92	2.79*	1.07
WAA_Proficient	-0.05	0.17	0.94	0.21	0.23	1.24	0.24	0.31
WAA_Advanced	0.02	0.21	1.02	0.55*	0.25	1.74	-0.24	0.28
White	0.07	0.38	1.07	0.17	0.68	1.19	-3.21*	1.23
Basic x White	-0.03	0.53	0.96	-1.76	1.05	0.17	-17.10	703
Proficient x White	0.25	0.46	1.28	1.65	0.87	5.21	13.84	703
Advanced x White	-0.13	0.61	0.87	-2.30	1.19	0.10	-35.54	5.44
Likelihood ratio test χ^2_7	1.265			39.61***			15.74*	

Note. *p<. 05; ***p<. 001; WAA= Wisconsin Alternate Assessment; ODRs= Office discipline referrals; + = Zero-inflated Poisson regression was used in the analysis; SE= Standard error. Non-White was the reference group.

Research Question 4: Do students with ID's middle and high school outcomes (i.e., 8th grade reading, secondary attendance, credits earned, ODRs, and suspensions received) and/or their relationship to 5th grade reading vary significantly by school type?

WKCE x School type. Two separate multiple regressions were run to determine whether the main effect of school type and its interaction effect with 5th grade WKCE reading scores significantly predicted students' 8th grade reading and secondary absence days. As Table 24 shows, the main effect of school type and its interaction with 5th grade reading did not significantly predict students' 8th grade reading scores, $F_{(3, 103)}= 0.72$, $p=.545$ or secondary absence days, $F_{(3, 151)}= 1.98$, $p=.11$. The hypotheses that students attending innovative schools would have higher 8th grade reading score and attendance days were not supported.

Table 24

Summary of Multiple Regression Analyses for 5th Grade WKCE Reading Score and School Type Predicting 8th Grade WKCE Reading Score and Secondary Absence Days

	8th grade reading				*Secondary absence days*			
Predictors	*B*	*SE*	*β*	*95% CI*	*B*	*SE*	*β*	*95% CI*
5th grade reading	0.11	0.12	.11	[-0.12, 0.35]	0.00	0.00	.06	[-0.002, 0.003]
Innovative	14.83	72.90	.14	[-129, 159]	0.12	0.09	.10	[-0.05, 0.30]
5th grade reading x Innovative	-0.06	0.20	-.23	[-0.46, 0.33]	-0.13	0.09	-.20	[-0.32, 0.04]
R^2		.020				.038		
$F_{(3, 102)\ (3,151)}$		0.715				1.980		
n		107				155		

Note. WKCE= Wisconsin Knowledge and Concepts Examination; SE= Standard error; CI= Confidence interval; Traditional was the reference group.

Table 25 shows results from three separate negative binomial regression tests. The main effect of school type and its interaction with 5th grade reading score did not significantly predict students' secondary credits earned, ODRs, and suspensions received. The hypotheses that

students attending innovative schools would have higher secondary credits earned, lower ODRs, and lower suspensions received were not supported.

Table 25

Summary of Negative Binomial Regression Analyses for 5th Grade WKCE Reading Score and School Type Predicting Secondary Credits Earned, ODRs, and Suspensions Received (n=155)

	Credits			*ODRs*			*Suspensions*		
Predictors	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*
5th grade reading	-0.001	0.002	0.99	-0.007	0.003	0.99	-0.004	0.00	0.99
Innovative	-0.548	1.222	0.57	-0.630	1.534	0.53	-0.508	1.90	0.60
5th grade reading x Innovative	0.001	0.003	1.00	0.003	0.004	1.00	0.001	0.00	1.00
Likelihood ratio test χ_3^2	0.56			9.14			1.17		

Note. WKCE= Wisconsin Knowledge and Concepts Examination; ODRs= Office discipline referrals; SE= Standard error. Traditional was the reference group.

WAA x School type. An ordinal regression was run to test whether the main effect of school type or its interaction with 5th grade WAA reading results significantly predicted students' 8th grade WAA reading results. The regression model fitted well (Deviance $\chi_7^2 = 17.61, p = .41$). As Table 26 shows, school type and its interaction with 5th grade WAA result did not significantly predict students' 8th grade WAA results. The hypothesis that students attending innovative schools would have higher 8th grade WAA reading result was not supported.

Table 26

Summary of Ordinal Regression Analysis for 5th Grade WAA Reading Proficiency Level and School Type Predicting 8th Grade WAA Reading Proficiency Level (n= 223)

Predictors	*Estimate*	*SE*	*Wald*	*95% CI*
WAA_Basic	-2.78***	0.51	28.79	[-3.80, -1.76]
WAA_Proficient	-1.74***	0.40	18.31	[-2.53, -0.94]
WAA_Advanced	-0.58	0.57	1.03	[-1.70, 0.54]
Innovative	0.10	0.69	0.02	[-1.26, 1.47]
Basic x Innovative	0.04	0.83	0.00	[-1.58, 1.68]
Proficient x Innovative	-0.07	0.62	0.01	[-1.29, 1.14]
Advanced x Innovative	0.29	0.81	0.13	[-1.30, 1.89]
Likelihood ratio test χ_7^2	130.24***			
Pseudo Nagelkerke R^2	.475			

Note. ***p<. 001; WAA= Wisconsin Alternate Assessment; SE= standard error; CI= Confidence interval; Traditional was the reference group.

A multiple regression was run to examine whether the main effect of school type or its interaction with 5th grade WAA reading results significantly predicted students' absence days (Table 27). The model did not significantly predict students' secondary absence days ($F_{(7, 237)}$= 0.58, p=. 76). It explained only 1.7% of variance in absence days. The hypothesis that students attending innovative schools would have higher secondary attendance days was not supported.

Table 27

Summary of Multiple Regression Analysis for 5th Grade WAA Reading Results and School Type Predicting Secondary Absence Days (n=245)

Predictors	*B*	*SE*	*β*	*95% CI*
WAA_Basic	-0.11	0.14	-.08	[-0.39, 0.15]
WAA_Proficient	0.15	0.12	.14	[-0.09, 0.39]
WAA_Advanced	0.10	0.15	.07	[-0.18, 0.40]
Innovative	-0.02	0.15	-.14	[-0.33, 0.29]
Basic x Innovative	0.04	0.20	.04	[-0.35, 0.44]
Proficient x Innovative	-0.06	0.16	-.05	[-0.39, 0.26]
Advanced x Innovative	-0.07	0.19	-.04	[-0.46, 0.31]
R^2	.017			
$F_{(7, 237)}$	0.587			

Note. WAA= Wisconsin Alternate Assessment; SE= Standard error; CI= Confidence interval. Traditional was the reference group.

Table 28 shows results from three separate negative binomial regression tests. No significant relationship was found for credits earned. However, significant relationships were found for ODRs (*Likelihood ratio* $\chi^2_7 = 44.38$, $p<.001$) and suspensions (*Likelihood ratio* $\chi^2_7 = 26.42$, $p<.001$). The main effect of school type on ODRs was significant (p=. 043). For students attending innovative high schools, the expected log count of ODRs received increases by 1.24. In other words, the students with ID who attend innovative high schools have 3.46 times the number of ODRs compared to students with ID who attend traditional schools. Overall, my hypotheses that students with ID attending innovative schools would have higher secondary credits earned and lower suspension received were not supported. However, students attending

innovative schools received significantly higher mean ODRs compared to students attending traditional schools across all 5th grade reading proficiency levels.

Table 28

Summary of Negative Binomial Regression Analyses for 5th Grade WAA Reading Result and School Type Predicting Secondary Credits Earned, ODRs, and Suspensions Received (n=245)

	Credits			*ODRs*			*Suspensions*		
Predictors	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*	*B*	*SE*	*Exp (B)*
WAA_Basic	-0.03	0.28	1.04	1.50*	0.55	4.48	2.08	1.08	8.06
WAA_Proficient	0.02	0.25	1.00	-0.12	0.35	0.88	-0.26	0.51	0.76
WAA_Advanced	-0.05	0.29	0.99	0.80*	0.38	2.23	1.16*	0.50	3.21
Innovative	-0.07	0.31	0.95	1.24*	0.61	3.46	1.46	1.19	4.33
Basic x Innovative	0.12	0.40	1.10	-1.04	0.70	0.35	-1.32	1.29	0.26
Proficient x Innovative	-0.05	0.33	0.95	0.68	0.45	1.98	0.89	0.64	2.44
Advance x Innovative	0.06	0.39	0.99	-0.52	0.49	0.59	-1.2	0.65	0.27
Likelihood ratio test χ_7^2		0.139			44.38***			26.42***	

Note. *p<. 05; ***p<. 001; WAA= Wisconsin Alternate Assessment; ODRs= Office discipline referrals; SE= Standard error. Traditional was the reference group.

Summary

I summarize the results of this study in Table 29. The following table contains information regarding the study's hypotheses for each research question and results from regression tests.

Table 29

Summary of Results

Research Question and Hypothesis	Test Results
Research Question 1	
Hypothesis 1: Students with ID's 5th grade WKCE reading score would significantly and positively predict their 8th grade reading score.	Not supported.
Hypothesis 2: Students' 5th grade WAA reading level would significantly predict their 8th grade WAA reading level.	Supported.
Research Question 2	
Hypothesis 3: Students' 5th grade WKCE/WAA reading result would significantly predict higher secondary attendance.	Not supported.
Hypothesis 4: Students' 5th grade WKCE reading result would significantly predict higher credits earned in one secondary semester, lower ODRs, and lower suspensions received.	Supported for ODRs only.
Hypothesis 5: Students' 5th grade WAA reading result would significantly predict higher credits earned in one secondary semester, lower ODRs, and lower suspensions received.	Not supported. (Results were significant in the negative direction for ODRs and suspensions)
Research Question 3	
Hypothesis 6: White students would have higher 8th grade reading results, higher attendance, higher credits earned, lower ODRs, and lower suspensions compared to their non-White counterparts.	Supported for attendance and suspensions only.
Research Question 4	
Hypothesis 7: Students attending innovative schools would have higher 8th grade reading results, higher attendance, higher credits earned, lower ODRs, and lower suspensions compared to their counterparts attending traditional schools.	Not supported. (Results were significant in the negative direction for ODRs)

Note. ID=Intellectual disability; WKCE= Wisconsin Knowledge and Concepts Examination; WAA= Wisconsin Alternate Assessment; ODRs= Office discipline referrals.

CHAPTER 5

DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

The purpose of this study was to answer four research questions. First, I examined whether students with ID's 5th grade reading achievement in statewide general and alternate assessments predicted their 8th grade reading achievement on those same assessments. Results from regression tests suggested that students' 5th grade reading achievement was a significant predictor of their 8th grade reading achievement, but only for those students who took the alternate assessment. Second, I tested whether students' 5th grade reading achievement predicted four secondary outcomes: attendance, credits earned, ODRs, and suspensions received. Results revealed that students' 5th grade reading achievement significantly predicted their secondary ODRs and suspensions received, but not their attendance and credits earned. Third, I examined whether ethnicity/race and its interaction with 5th grade reading achievement predicted students' middle and high school outcomes. Results showed the significant predictive impact of students' ethnicity/race on their secondary attendance and suspensions received. Specifically, non-White students had significantly lower secondary attendance and received significantly greater suspensions compared to their White counterparts. Lastly, I tested whether school type (i.e., traditional vs. innovative) and its interaction with 5th grade reading predicted students' middle and high school outcomes. Results suggested that school type was a significant predictor of students' secondary ODRs received. Specifically, students attending innovative schools received a significantly higher mean number of ODRs compared to students attending traditional schools. In the remainder of this chapter, I first discuss the results of this study in detail. Then, I provide recommendations for future research. Lastly, I review the limitations of the study.

Early Reading and Later Reading Achievement

Informed by past research suggesting a relationship between early reading and later reading achievement for students in general, I hypothesized that students with ID's early reading achievement on statewide reading assessments would significantly predict their later reading achievement. I tested this hypothesis for two groups of students with ID: Students with ID who took (a) the general reading assessment and (b) the alternate reading assessment. Results from regression tests revealed different results for each group. For students who took the general assessment, my hypothesis was not supported as I found a non-significant relationship between students' 5th grade and 8th grade reading results. This result did not align with the previous research that suggested the positive and significant predictive impact of early reading achievement on students' later reading achievement (Adelson et al., 2016; Hernandez, 2011; Lesnick et al., 2010).

A non-significant relationship between early reading and later reading achievement can be related to reading achievement levels of students with ID in statewide general reading assessment. In this study, a closer examination of reading proficiency levels showed that a majority of students with ID performed at the minimal reading level both in 5th grade and 8th grade. This result was consistent with the results of previous research about the reading achievement levels of students with ID. For example, researchers found that across grade levels students with ID had the lowest statewide reading assessment performance compared to other students with disabilities in Florida (Trexler, 2013) and in North Carolina (Schulte et al., 2016). Given that students with ID are likely to remain at the minimal reading proficiency level across grade levels, it can be concluded that these students' early reading achievement in statewide general assessment does not predict their later reading achievement in the same assessment.

Additionally, the percentage of students with ID in reading proficiency levels did not significantly change from 5th grade to 8th grade in the general reading assessment. This result did not support a Matthew effect (i.e., increasing gap) or compensatory reading development pattern (i.e., decreasing gap). Rather, it suggests stable reading achievement for students with ID in the general reading assessment. Yet, assessments that use composite reading scores may be too broad to capture students' actual reading performance because they measure higher and lower reading skills together (Pfost et al., 2014). In a recent study, van Wingerden, Segers, van Balkon, and Verhoeven (2017) examined the predictors of reading comprehension for students with ID in the Netherlands. The researchers found that students with ID's word decoding, listening comprehension, early reading skills (e.g., rhyme, blending, deletion), and temporal processing were significant predictors of reading comprehension. As this study suggests, an examination of specific reading components (e.g., phonics, vocabulary, comprehension) might provide a more nuanced evaluation of predictors of reading success for students with ID as well as a better understanding of the developmental pattern of reading for students with ID.

It should not be acceptable for a majority of students with ID to languish in the lowest level of reading proficiency for over a three-year period. In this study, I may not actually be able to detect growth or lack of growth because students' scores are all grouped into proficiency categories that are not sensitive to minor changes. One way to make meaning of results is to compare the percentage of students with ID in each reading proficiency level. I found that more students with ID scored at the minimal proficiency level in 8th grade than they did in 5th grade (86% vs. 77.6%). This means that some students' mastery of 8th grade standards was at a lower level to their later mastery of 5th grade standards. Cihak and Grim (2018, p. 178) state that researchers no longer examine questions such as: Should academic skills (e.g., reading) be taught

to students with ID? Rather, they focus more on: How does instruction improve students with ID's reading skill?

It also should not be inferred from this study's results that the existing accountability system is harming students with ID by including them in reading assessments year after year. This kind of inference underestimates students with ID's capabilities in reading. Rather, I recommend that the results should be used to advocate for the implementations of more effective reading instruction for these students in schools. We know from past research that students with ID were able to acquire reading skills via developmental and functional curricula (Browder & Xin, 1998; Brown, Hermanson, Klemme, Haubrich, & Ora, 1970; Brown et al., 1974). Recently, more students with ID are educated in inclusive classrooms; thus, are expected to have access to academic content or general education curriculum. Teaching academic skills (e.g., reading) to students with ID promotes "equal access to the educational content all students receive" (Spooner & Browder, 2006, p. 5). As a result, all students with ID – along with their peers without disabilities – are included in school accountability system via general or alternate reading assessments. The participation of students with ID in these assessments is a timely and positive movement toward promoting equal and just educational opportunities in schools.

However, how can we explain students with ID's low performance in statewide reading assessments? Compton-Lilly (2017) states that "failing high-stakes tests, falling behind with reading…are all temporal disruptions that define students as unsuccessful" (p. 21). She indicates that these temporal situations are open to alternative interpretations. Here, I propose three hypotheses that require further investigations in schools. First, how we test students with ID may not capture growth in reading. As I discussed earlier, statewide assessments may not measure small but meaningful reading development. Hence, more sentive measurements of reading might

better explain this population's reading development across time. Second, these students may not be getting any effective reading instruction in schools. Past observational research of reading instruction for students with ID showed that instruction did not usually reflect effective practices (Ruppar, 2015). Thus, these students' low reading achievement might be attributed to ineffective instruction and/or teachers who lack appropriate skills. Third, the type of instruction may not be capturing or addressing other more fluid forms of reading. Reading is viewed as a complex social and cultural phenomenon in which students make meaning of a particular form of text in a particular social situation (Hassett, 2008). Students' reading experiences and preferences may change across time, grade level, social or cultural contexts (Compton-Lilly, 2012). Thus, it is important to examine whether the type of instruction is aligned with students with ID's cumulative reading experiences within multiple environments (e.g., classroom, school, home) as well as over time.

Given that the majority of students with ID performed at the lowest reading proficiency level from 5th grade to 8th grade, it may be logical to suggest the implementation of effective instructional strategies for these students from early grades until graduation. The question then arises: What are some effective strategies? First, a good example of effective reading instruction strategy for students with ID is multicomponent reading instruction. This type of instruction includes between two to five components of reading (i.e., phonemic awareness, phonics, vocabulary, fluency, comprehension) and research evidence suggests that its use leads to improvement in students with ID's reading skills over time (Afacan et al., 2017; Allor et al., 2014; Browder et al., 2012). Second, as Lemons, Allor, Al Otaiba, and LeJeune (2016) suggested, using data to monitor progress and make ongoing adaptations to reading instruction can maximize the benefit of the instruction and enhance the chance that students with ID

improve their reading achievement in statewide assessments over time. Third, Copeland, Keefe, and de Valenzuela (2014) recommended incorporating students with ID's home language, social, and cultural background into reading instruction to meet the students' individual needs and interests. Lastly, as Martin and Hauth (2015) recommended, teaching test-taking strategies and appropriate computer skills as well as supporting and motivating students with reviews and test preparation to minimize test anxiety during the school year might be helpful to improve students with ID's reading performance in statewide general assessments.

The results also revealed a positive and significant relationship between 5th grade and 8th grade reading achievement for students who took the alternate assessment. Unlike the results for students in the regular assessment, students who scored at basic and proficient reading levels in 5th grade on the alternate assessment significantly increased their chances of being in a higher reading proficiency level in 8th grade. In contrast, students who scored at advanced reading level in 5th grade on the alternate assessment were also likely to score at the same reading proficiency level in 8th grade. In other words, low performing students significantly improved their chances of being in a higher reading proficiency level over three years whereas high performing students' reading proficiency level did not change during the same time. This suggests a compensatory reading development pattern for students who took the alternate assessment. Nonetheless, the change in the percentage of students in each proficiency level was relatively small. This result was consistent with the results of Tindal et al.'s (2016) study in which they examined students' alternate reading assessment results from 3rd grade to 5th grade in the state of Oregon and found that fewer than 9% of students improved their reading scores from below proficiency to above.

Alternate assessments are modifications of general assessments. Their content may vary in breadth and depth but they must stil measure grade-level academic standards. Results

producted from these assessments were found to be valid and reliable indicators of the academic performance for students with ID in Wisconsin (Roach & Elliott, 2006; Roach, Elliott, & Webb, 2005; WDPI, 2015). The examination of reading results in the alternate assessment is meaningful for accountability reasons, (e.g., reporting percentage of students who meet reading proficiency), as well as informative for different stakeholders who are invested in outcomes for students with ID (e.g., educators, families, researchers). Yet, the interpretation of reading results in alternate assessments is somewhat difficult. Each WAA test is administered based on individual student's accommodation needs and instructional level; however, in all cases, a teacher notes the student's answer on the answer sheet that is submitted for scoring (WDPI, 2015). Students who take the alternate assessment might not literally read when these assessments are administered. For example, a common accommodation in an alternate assessment is for a proficient reader (e.g., a teacher) to read aloud assessment questions for a student. The student's role may involve choosing an answer among existing options. Thus, how well a student can read might determine the type of accommodation, which can then make the assessment a less close measure of the student's actual reading performance.

Another important factor that may explain the students' alternate assessment scores is the quality of teacher and instructional practices that the student is provided leading up to taking the test. Researchers reported that training teachers on effective instructional practices positively and significantly led to improvement in the students' alternate assessment scores (Browder, Karvonen, Davis, Fallin, & Courtade-Little, 2005). In another study, researchers found that when instruction and curriculum focused on the general curriculum, students with ID performed better on the state's alternate reading assessment (Roach & Elliott, 2006). Given these previous findings, it can be concluded that students with ID's alternate assessment results may reflect

what they are learning and studying in classrooms. For this reason, special education teachers may benefit from receiving professional development or training on effective instructional practices to promote inclusion and access to the academic curriculum (Chamberlain & Witmer, 2017; Goldstein & Behuniak, 2012; Roach & Elliott, 2006). If instructional practices do not match with the alternate assessment content or vice versa, students with ID may have low reading scores in the assessments. This may be the case, for example, for the students with ID who performed at minimal or basic reading levels in this study.

This study's results revealed a non-significant relationship between students with ID's 5th grade and 8th grade reading achievement in the general assessment. In contrast, a significant relationship was found between 5th grade and 8th grade reading achievement in the alternate assessment. What is the meaning of this significant relationship in the alternate assessment? Obviously, improved reading performance in the alternate assessment is a positive result. Several states use statewide assessment results as one of multiple criteria for high school graduation (Martin & Hauth, 2015); thus, it is essential that students with ID improve their reading achievement in statewide assessments to be able to obtain a high school diploma. Given that this study suggests mixed results, it is important to identify and implement effective reading instruction strategies that will result in improved reading outcomes on statewide assessments for students with ID. Another important implication might be that past research did a better job of determining who should be in the alternate assessment (Cameto et al., 2009; Kearns et al., 2009). If researchers can capture growth better in the alternate assessment, it might be more useful for instruction and for capturing growth over time.

Early Reading and Later Academic and Behavior Outcomes

Researchers have made recommendations for examining the relationship between statewide reading assessment results and later school outcomes for students with ID (Browder, 2001; Towles-Reeves et al, 2009). I tested the relationship between students with ID's 5th grade reading results in statewide general and alternate assessments and four secondary outcomes: attendance days, credits earned, ODRs, and suspensions received. My initial hypothesis was that students with ID's 5th grade reading achievement would significantly predict their secondary academic and behavior outcomes, just as early reading predicts these outcomes for readers in general (Lesnick et al., 2010; Lin et al., 2013; Morgan et al., 2008).

The regression results did not support my hypothesis for the academic outcomes (i.e., attendance and credits earned) for either group; that is, not for students in the general or the alternate assessment. Similarly, in a past study, Kleinert et al. (2002) also did not find a significant relationship between alternate reading assessment results and post-school outcomes for students with significant disabilities. Three possible explanations can be made for this non-significant relationship. First, there may actually not be a relationship between students with ID's 5th grade reading achievement and their secondary attendance days and credits earned. A second explanation might be that the non-significant results are due to low statistical power in the analyses. Even though the minimum number of students was secured in all analyses, with a larger sample size of students with ID, statistical power would be increased in the analyses. A third explanation might be that the measures of 5th grade reading that I relied on in this study might not be sensitive enough to detect a significant relationship between early reading and secondary academic outcomes. This may be particularly true for the alternate assessment; it might be difficult to see a significant relationship with a categorical predictor rather than a

continuous predictor. Based on these explanations, I recommend that the significance of the relationship between early reading achievement and secondary academic outcomes be tested again in the future.

On the other hand, I did find a significant relationship between students' 5th grade general reading achievement and secondary ODRs received. This result supported my hypothesis regarding secondary behavior outcomes. Specifically, I found that as students' reading scores increased in the general reading assessment, their secondary ODRs received significantly decreased. This result suggests a positive impact of early reading achievement on students with ID's secondary ODRs received. In the literature, researchers reported a similar relationship between students' academic achievement and behavior outcomes. For example, Arcia (2006) examined school outcomes for students who were suspended at least one time over three academic years and for a matched comparison group who were not suspended in a large urban school district. Arcia reported that students with lower reading achievement subsequently received more suspensions compared to students with higher reading achievement. Similarly, Lassen, Steele, and Sailor (2006) found that a diverse group of middle school students who received fewer suspensions in 6th grade performed significantly higher in both reading and math tests in 8th grade. Consistent with the past research, this study's results also showed the significant predictive impact of 5th grade reading score on secondary ODRs received for students with ID who took the general reading assessment.

The results also suggested a positive and significant relationship between students with ID's alternate reading achievement and secondary ODRs and suspensions received – but in the opposite direction than predicted, not supporting my hypothesis. Students with ID who had high 5th grade alternate reading proficiency level received more secondary ODRs and suspensions.

This result might be related to the intersection of reading achievement and IQ level as past research reported the influence of IQ on students with ID's reading attainment (Allor et al., 2014). Students with ID are more likely to demonstrate behavior challenges when high stakes, demands, or expectations occur along with challenges associated with having ID (Boutot et al., 2018). Though I did not have data to support this statement, teachers might hold high expectations for academic achievement and less tolerance for inappropriate behavior as students' reading success increases. That is, teachers might be more likely to formally discipline students with ID who have higher acheviement and who also do not meet behavior expectations in classrooms. In contrast, teachers might tolerate similar behavior problems from students who have lower reading achievement.

This study's results support past research suggesting a significant relationship between students' early reading achievement and their later behavior outcomes (Lin et al., 2013; Morgan et al., 2008). Yet, behavior outcomes should not be interpreted as sole indicators of individual student behavior. Instead, they may also reflect teacher subjectivity or school climate. In the literature, researchers have often criticized the excessive use of exclusionary disciplinary actions based on teachers' subjective decisions, particularly for Black students (Losen & Gillespie, 2012; Skiba et al., 2014). Additionally, Perzigian (2015) found that as students positively rated their school climate, lower numbers of ODRs were reported, particularly in innovative schools. In the current study, it was not possible to examine school climate and student or teacher related factors that resulted in disciplinary actions. Future studies might be able to verify this study's results related to the relationship between early reading achievement and later behavior outcomes for students with ID by examining school climate and disciplinary practices in schools firsthand.

Ethnicity/Race, School Type, and Student Outcomes

Disability identification and ethnicity/race often intersect. For example, Black students are more likely to be labeled as EBD (Bal et al., 2017) and ID (Sullivan & Bal, 2013; U.S. Department of Education, 2016) compared to their White counterparts. Nevertheless, researchers usually ignore the intersection of disability and ethnicity/race in studies as they generally hold "a color-blind disability ontology" (Artiles, Dorn, & Bal, 2016, p. 803). Similarly, research on students with ID's school outcomes by their ethnicity/race is still rare. In this study, I tested the main effect of ethnicity/race and its interaction effect with early reading on students with ID's academic and behavior outcomes. My initial hypothesis was that White students with ID would have favorable outcomes compared to their non-White counterparts with ID. Results from regression tests revealed the significant impact of the main effect of ethnicity/race on students' secondary attendance and suspensions received, but only for those students who took the alternate assessment. The regression results were in favor of White students: (a) White students with ID had significantly higher secondary attendance days compared to non-White students with ID and (b) White students with ID received significantly fewer suspensions compared to their non-White counterparts with ID.

I found significantly higher secondary school attendance days for White students with ID as compared to their non-White counterparts with ID. This result is in agreement with past research related to school attendance (Ginsburg et al., 2014). When poor attendance intersects with ethnicity/race, it is likely to increase risks for students because their academic success, such as reading achievement, may be negatively impacted (Ginsburg et al., 2014). A closer examination of students with ID's school attendance may allow researchers to document some common reasons for poor attendance. For example, health issues (e.g., taking medication),

behavioral issues (e.g., out-of-school suspension), or non-school related responsibilities (e.g., taking care of sibling) might be some common reasons for poor attendance. Thus, helping non-White students with ID to increase their school attendance may help to eliminate some of the negative consequences of poor attendance (e.g., low reading achievement) that are being experienced differentially by students of color with ID during their high school years.

Using data from the National Longitudinal Transition Study 2 (NLTS2), Gonzalez (2006) reported that 33% of students with ID were found ever to receive suspension or expulsion in one school year. The current study further revealed that suspension outcomes varied significantly by students' ethnicity/race. Specifically, non-White students with ID experienced significantly higher mean number of suspensions than White students with ID. Bal (2016) stated that racial disproportionality in exclusionary discipline actions (e.g., suspension) has been recognized as a major social and historical problem that often limits nondominant students' opportunities in school and society. Nationally, approximately 3 million students received out-of-school suspensions in 2011-12 school year (Musu-Gillette et al., 2017). Among them, Black students received the majority of suspensions compared to students from any other ethnic/racial groups. In this study's sample, Black students constituted the largest group of non-White students (i.e., 69%). Thus, the intersection of ID and ethnicity/race highly likely resulted in more school suspensions for Black students with ID in this study.

During the last two decades, addressing behavior problems before they occur and ultimately decreasing the number of discipline punishments has been a primary aim of research and practice. School-wide multitier behavior support programs such as Positive Behavioral Interventions and Supports (PBIS) have emerged as a result of this aim (Sugai, Horner, & McIntosh, 2016). Overall, PBIS has been successful in decreasing reported discipline actions

across the country. However, Black students continued to receive a disproportionate number of exclusionary discipline actions (Vincent & Tobin, 2011). Recently, researchers have suggested culturally responsive implementations of behavior support programs. For example, in Wisconsin, Bal has developed and implemented a Learning Lab intervention to make school discipline systems culturally responsive and ultimately address disproportionality in school discipline outcomes (Bal, Kozleski, Schrader, Rodrigues, & Pelton, 2014; Bal, Schrader, Afacan, & Mawene, 2016). In Learning Labs, diverse stakeholders (e.g., educators, families, community representatives, students, and researchers) collaborate to understand social and historical factors of disproportionality and develop culturally responsive school discipline systems. Students with ID, specifically those who are non-White, can benefit from culturally responsive implementations of behavior support programs in schools.

Very little is known about students with ID's participation and outcomes specifically in innovative schools that generally focus on art, technology, language, or college preparation. Enrollment in innovative schools is typically by parent or family choice (Perzigian et al., 2017; Raywid, 1994); thus, I anticipated that students in innovative schools would comply with rules and expectations related to academic achievement or behavior criteria. For this reason, my initial hypothesis was that students attending innovative schools would have favorable outcomes compared to their peers in traditional schools. However, students attending innovative schools received significantly higher ODRs compared to their counterparts attending traditional schools. This result showed the significant impact of school type on students' secondary ODRs received. This result was consistent across all 5th grade WAA reading proficiency levels. A closer examination of discipline procedures in the future might be able to provide more explanation of why students with ID received higher mean number of ODRs in innovative schools. Student or

teacher related factors of reported ODRs should be well documented across traditional and innovative schools. Additionally, school climate ratings completed by students with ID, their teachers, and parents could also provide further information about why students with ID received more ODRs in innovative schools.

One possible explanation for different student behavior outcomes across traditional and innovative schools may relate to the type of discipline procedures implemented in these schools. Students with disabilities may be subject to strict discipline procedures in alternative, innovative school settings. For example, a report published by Losen, Keith, Hodson, and Martinez (2016) documented behavior outcome disparities among students attending charter schools. The researchers found that at least half of students with disabilities attending charter schools were suspended. Moreover, students attending charter schools were more likely to receive suspensions compared to their counterparts attending traditional schools. As the researchers argue, students with disabilities may be negatively impacted by strict discipline rules and policies in alternative schools. In the current study's sample innovative schools, students with ID might have also experienced more strict discipline rules compared to their counterparts attending traditional schools. Implementations of discipline procedures that result in students with ID missing instruction could be considered detrimental to students with disabilities who enroll in innovative alternative schools. Instead, alternative schools should consider utilizing effective behavior support strategies that keep students in classrooms and provide equal educational opportunities for all students, regardless of their ethnic/racial, socioeconomic, gender, and ability differences.

This study's results also suggested a non-significant impact of school type on students with ID's academic outcomes: Reading achievement, attendance, and credits earned. My initial hypothesis was that students attending innovative schools would have favorable academic

outcomes compared to students attending traditional schools. My hypothesis was not supported, as attending an innovative school was not associated with improved reading scores, attendance, or credits earned for students with ID. Innovative schools are often positioned as positive choice for students who experience academic or behavior difficulties in traditional schools (Lehr, 2004; Raywid, 1994; Wilkerson, Afacan, Perzigian et al., 2016). Thus, I expected innovative schools to better address students with ID's unique needs, interests, or challenges through supportive and innovative educational approaches. However, my expectation was not supported with the results of this study.

Non-significant results, particularly in reading and credits earned, may be attributed to the quality of personnel, resources, or services provided for students with ID in innovative schools. For example, past studies have reported a lack of qualified school personnel who could work with students with disabilities as well as inadequate resources and services in alternative schools (Lange, 1998; Lehr et al., 2009; Wilkerson, Yan et al., 2016). Also, there may be differences between traditional and innovative schools at the classroom level (e.g., their reliance on special education classrooms vs. inclusive general education classrooms). In general, inclusive education settings have been reported as promoting positive academic outcomes for students with ID as compared with special schools or self-contained classrooms (de Graaf & van Hove, 2015; Ryndak et al., 2010). Thus, an examination of classroom types within and across traditional and innovative schools is recommended for future researchers.

Recommendations for Future Research

Based on this study's results, I provide some recommendations for future research. First, Ruppar (2017) found in an interview study of eight special education assistants that the educators' definition of reading instruction, beliefs, and self-efficacy impacted the quality of

reading instruction provided for students with severe disabilities. Thus, I recommend that future research should look at what is happening in the classrooms and how the teachers' beliefs affect expectations which then affect students with ID's reading outcomes. Similarly, future research should examine the perspectives of special educators on what they think best explains their students' reading level. I also recommend that future research tap into the insight and expectations of family members for students with ID in statewide reading assessments.

Second, Compton-Lilly (2013) stated that "…we have not done enough to document the cumulative and evolving experiences of children – especially children from communities that have been underrepresented in school" (p. 64). This rings true in the field of severe disabilities. Longitudinal qualitative case studies of students with ID are still rare in the area of reading (Ruppar, 2015; Ryndak, Morrison, & Sommerstein, 1999). Hence, I recommend that future research should examine how students with ID's reading experiences and preferences change across years. In a longitidunal case study, Compton- Lilly (2012) followed students from different ethnic and socioeconomic backgrounds to study the change in their literacy experiences over 8 years. Similarly, a group of students with ID who represent a wide range of perceived severity of disability, communication, and accommodation needs might be observed in schools to document the change in their reading experiences and preferences over time. This type of longitudinal qualitative inqury could provide valuable insights into various factors that support or restrict students' access to effective reading practices in schools.

Third, statewide assessments are formal data sources that may inform teachers about their students' past and current reading achievement. These assessment results can help teachers in making data-based decisions when implementing reading instruction for students with ID. Future research should examine whether reading results from statewide general or alternate assessments

influence teachers' instructional decisions. A statewide survey study or an interview study can help to document effective reading instruction strategies implemented for students with ID who have low reading achievement in statewide assessments. Results from these studies may be informative for other educators who have students with similar needs in their classrooms.

Fourth, examining students with ID's statewide reading results and their relationship with later outcomes is a relatively new research topic. I tested this relationship for five middle and high school outcomes in this study. In another study, Kleinert et al. (2002) examined students with ID's post-school outcomes. Future research should continue to examine how students with ID's success in multiple areas such as early reading, functional skills, or adaptive behavior impact their middle, high, and post-school outcomes. For example, future research could seek to answer following questions: Is early reading achievement a significant predictor of future employment, quality of life, independent living, self-determination, inter-personal relationships, high school graduation, or college attendance? Future research should address these questions to fill an important gap in the field. This is important because identifying predictors of later school and post-school outcomes of students with ID may help to design and implement effective early intervention programs to increase these students' achievement in the future.

Fifth, an examination of students with ID's reading results in statewide general and alternate assessments revealed an interesting finding. I found that some students with ID switched test types from one testing year to another. Specifically, 70 students switched test types from 5th grade to 8th grade. Farley et al. (2016) also discussed test switching as an issue for some students with ID in their study. Existing statewide test systems allow students with ID to switch between test types at the recommendation of the students' IEP team. Thus, future research should specifically examine the following questions: Why do students with ID switch from general

reading assessment to alternate reading assessment or vice versa? Who makes this decision and based on what criteria? How often do students with ID switch test types during their PK-12 school years? Does switching test types negatively impact teachers' ability to use test results to guide instruction?

Lastly, another recommendation for future research pertains to students with ID's behavior outcomes such as ODRs and suspensions received. The literature suggests that a higher percentage of students with ID experience behavior difficulties in schools that often result in ODRs or suspensions (Gonzalez, 2006). Students with ID's behavior outcomes require further examination. For example, why do students with ID receive ODRs or suspensions in schools? I think that this is an important question to answer. Answering this question may help to document reasons for ODRs or suspensions given to students with ID. This is important because minor or major behavior problems may require different types of interventions. Future research should also list student, teacher, or school level reasons for ODRs and suspensions to help professionals better interpret behavior outcomes of students with ID. For example, teacher characteristics or school climate may also have an impact on students with ID's behavior outcomes. Finally, future research should examine the impact of behavior support programs such as PBIS (Sugai et al., 2016) and culturally responsive implementations of PBIS (Bal et al., 2016) on students with ID's behavior outcomes. Overall, positive behavior support programs are successful in reducing behavior problems in schools; exploration of their use and impact for students with ID who experience behavior difficulties is recommended for future research.

Limitations

One limitation is related to my lack of information on students with ID's actual reading levels. The type of data that I had access allowed me to examine students' reading achievement

on general and alternate reading assessments based on proficiency levels. I was not able to go beyond reading proficiency levels (e.g., watching students while they were reading) and describe students' real reading development pattern. For this reason, a lack of information on students' actual reading levels was a limitation to the study.

Another limitation pertains to the lack of information on participating students' IQ level. All students who participated in this study received special education services under the ID category in the 2012-13 school year. However, I did not have data related to students' measured IQ level. It would be informative to know students' IQ and take it into account in the analyses. Thus, I acknowledge a lack of information on students' IQ level as another limitation to this study.

Lastly, I used a sample from an ethnically and economically diverse urban school district. The sample was not a nationally representative sample of all students who were identified with ID. Consistent with national statistics, Black students were overrepresented within the ID category in this study's sample. National statistics also show that American Indian and Native Hawaiian students have high-risk ratio within ID category (1.58 and 1.64 respectively; U.S. Department of Education, 2016). Yet, these students were not represented in this study's sample. Future research should ensure that participants are diverse in gender, ethnicity/race, and socioeconomic background so results can be better generalized to the larger population. For this reason, overall results may be generalized to other school districts that have similar student characteristics, but not to the general population.

Conclusion

Students with ID were historically excluded from statewide assessments. Since NCLB (2002), federal laws (e.g., ESSA, 2015; IDEA, 2004) require participation of all students with

disabilities, including those with ID, in statewide reading assessments. Local schools, districts, and state education agencies have been tracking students with ID's participation as well as achievement in statewide reading assessments during the last 16 years. An examination of the reading performance of students with disabilities in statewide reading assessments is a recent research topic (Farley et al., 2016; Schulte et al., 2016; Tindal et al., 2016; Trexler, 2013). Researchers have mainly focused on comparing students with disabilities' reading results in statewide reading assessments across disability categories as well as documenting these students' reading growth over time. The current study contributes to this growing body of literature by examining the impact of students with ID's early reading achievement in statewide general and alternate assessments, ethnicity/race, and school type attended on their middle and high school outcomes.

In conclusion, this study's results suggest that students with ID's early reading achievement was a significant predictor of their later reading achievement, yet only for those students who took the alternate assessment. Additionally, students' early reading achievement had significant predictive value on their secondary ODRs and suspensions received, but not their attendance and credits earned. Moreover, these students' secondary outcomes (e.g., attendance, ODRs, and suspensions) significantly varied by their ethnicity/race and type of school attended (i.e., traditional vs. innovative). Specifically, non-White students had significantly lower secondary attendance and received significantly greater suspensions compared to their White counterparts. Students attending innovative schools received a significantly higher mean number of ODRs compared to students attending traditional schools. This study illustrates the importance of examining not only early reading achievement, but also the impact of individual (e.g.,

ethnicity/race) and school characteristics (e.g., traditional vs. alternative) on later academic and behavior outcomes for students with ID.

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APPENDIX A

School Coding Protocol

SECONDARY ALTERNATIVE SCHOOL PLACEMENT

School Type Coding Protocol

Completing Coding Form

1. If you are the primary coder, locate the district website or document that contains all school descriptions. If you are IOA coder, check with primary coder to verify that you are using the same source of information.

2. On the top of the coding sheet circle PRIMARY or IOA to indicate whether you are primary or IOA coder. Place your initials and the date on the line. (Leave ENTERED and CHECKED blank as those are for data entry and checking).

3. Indicate which school district the school is in, the full school name (no abbreviations), the total enrollment of that school (for 2013-2014), and the grade levels that are served at the school.

4. Answer questions 1 through 4 to the best of your ability. For questions coded YES, specify why you selected that as your code. Consider the following information in determining the appropriate codes:

    - If students need to apply to the program or have parental consent, code it as **Choice (Question 2)**
    - **Specific skills (Question 3)** must be emphasized for the majority of the school population defined as 70% of the grades served. An example would be a school that serves grades 6 – 12, and focuses on college prep using a specialized curriculum (e.g., IB curriculum) for grades 9 – 12. A non-example would be a school that offers college courses to two of the six grades it serves.

5. If you feel that you are unable accurately code a question with the information provided about the schools, circle the number of the question and move on to the next question.

6. If there are any questions that you circled due to uncertainty, bring to project meeting to discuss with project team. If a decision still can't be made, place in "Contact District Designee" folder. (See Contact District Designee procedures below)

7. If all questions are answered, select a school type final code based on the answers to questions 1 through 4.

School Type Final Codes

After providing answers to questions 1 through 4 on the coding form for a specific school, consider the following coding definitions of the different types of school settings and select one based on the information you collected.

TRADITIONAL

Educational settings where the majority of the school district's secondary students receive educational services. These schools typically have an attendance area, but do accept interested students from outside this area.

(Q1: No, Q2: Choice, Q3: No, Q4: No)

ALTERNATIVE 1

Educational settings where a proportion of the school district's secondary students choose to attend in order to access innovative educational and/or instructional approaches or schools that target specific skills (i.e., technology) or student populations other than "at risk" students.

(Q1: Yes/No, Q2: Choice, Q3: Yes/No, Q4: No)

ALTERNATIVE 2

Educational settings where a proportion of the school district's secondary students are assigned to receive educational services as a last option before expulsion – emphasis on behavior modification or remediation

(Q1: Yes, Q2: Assigned, Q3: No, Q4: Yes - behavior)

ALTERNATIVE 3

Educational settings where a proportion of the school district's secondary students are assigned to receive educational services that emphasize academic and/or behavioral remediation

(Q1: Yes, Q2: Choice/Assigned, Q3: No, Q4: Yes – academic or both)

Contacting School District Designee

If coders are unsure of which final code is appropriate for a certain school or are unable to specify details for certain questions on the coding form, the case will be discussed with the research team at the project meeting. If a consensus is not reached at the project meeting, the school will be set aside. For each district, there will be an "Contact District Designee" folder created and schools that are difficult to code will be set aside in this folder until all schools in that district are coded. Once coders complete coding for a specific district, members of the research team will call the district staff member designated as the district contact for the project to ensure accurate coding. Once information for answering Questions 1 through 4 is obtained from the school district designee, coders will select a School Type Final Code.

APPENDIX B

School Coding Form

SECONDARY ALTERNATIVE SCHOOL PLACEMENT
School Type Coding Form

School Name _____

Total Enrollment _____ **Grades Served** _____

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1. Is the school listed as alternative, charter, contract, transformation, intensive or some category other than Middle/High School on district website?

□ Yes (specify: _____) □ No

2. Do the majority of enrolled students at this school attend as a choice or were they assigned/referred there?

□ Choice □ Assignment/Referral

3. Is the school focused on a particular skill area (e.g., art, IB curriculum, technology) or targeting a specific student population other than "at risk"?

□ Yes (specify: _____) □ No

4. Is the school aimed at academic/credit or behavioral remediation?

□ Yes (specify: _____) □ No

School Type Final Code

□ Traditional □ Innovative □ Behavior-focused □ Academic-focused

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APPENDIX C

Data Required for Analyses

Variable	Unit of Measurement	Coding
School Type	Binary variable indicating type of school attending in middle or high school.	0= Traditional 1= Innovative
Prior Reading Achievement Performance	Categorical (or continuous) variable indicating 5th grade standardized state test reading proficiency level determined by the district.	0= Minimal 1=Basic 2=Proficient 3=Advanced
Middle School Reading Performance	Categorical (or continuous) variable indicating 8th grade standardized state test reading proficiency level determined by the district.	0=Minimal 1= Basic 2=Proficient 3=Advanced
Attendance (or absence) Record	Continuous variable indicating days of secondary attendance (absence) in 2012-2013 school year.	Absences were subtracted from the total number of days (175 days).
Credits Earned	Continuous variable indicating number of credits completed by student during the Fall 2012 semester. Each semester course is .5 credit.	Total number of credits earned during high school career – Total number of credits earned up to Fall 2012 semester.
Suspension	Count variable indicating number of suspensions for a student received during 2012-2013 school year.	Number suspensions were provided by the district as cumulative total number.
Referrals	Count variable indicating number of office referrals for a student during 2012-13 school year.	Number suspensions were provided by the district as cumulative total number.

APPENDIX D

WKCE and WAA Proficiency Level Definitions

Proficiency Levels	WKCE	WAA
Advanced	Refers to a comprehensive and in-depth understanding of rigorous subject matter and sophisticated solutions to complex problems.	Refers to an in-depth understanding of the academic content and skills tested on the WAA-SwD. Students who score in this range require no support in instructional settings to demonstrate consistent understanding and mastery of the content and skills included in the EGBS.
Proficient	Refers to a solid understanding of challenging subject matter and solving a wide variety of problems.	Refers to understanding of the academic content and skills tested on the WAA-SwD. Students who score in this range require no support in instructional settings to demonstrate understanding and mastery of the content and skills included in the EGBS.
Basic	Refers to partial mastery of prerequisite knowledge and skills that are fundamental for proficient work.	Refers to some understanding of the academic content and skills tested on the WAA-SwD. Students who score in this range require some support in instructional settings to demonstrate understanding of the contents and skills included in the EGBS.
Minimal	Refers to limited knowledge and skills in the subject matter and limited ability to apply knowledge and skills effectively.	Refers to an emerging understanding of the academic content and skills tested on the WAA-SwD. Students who score in this range require significant support in instructional settings to demonstrate understanding of the content and skills included in the EGBS.

Note. WKCE = Wisconsin Knowledge and Concepts Exam; WAA = Wisconsin Alternate Assessment; WAA-SwD = Wisconsin Alternate Assessment for Students with Disabilities; EGBS = Extended Grade Band Standards.