Modeling Growth and Placement Effects on Literacy Learning for Elementary-Aged Learners with Intellectual and Developmental Disabilities

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Abstract

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Little is known about the development of literacy and language skills within naturally occurring classroom contexts for students with IDD. This study conducted a quantitative analysis of growth in six key areas of literacy and language for students with IDD in grades 1-5. Multilevel linear modeling was used to evaluate mean trajectories and the predictive effects of grade level and inclusive educational placements on estimated growth. Data provided through teacher surveys was used to provide preliminary descriptions of literacy instruction for students with IDD across contexts. Results identified significant effects for both grade level membership and inclusive educational placements on student achievement in all literacy and language variables of interest. This analysis further examined the relationships between the focus of teacher instruction, educational placements, and student outcomes in literacy for young learners with IDD.

Acknowledgements

I would like to thank the faculty members, Dr. Roxanne Hudson, Dr. Carly Roberts, Dr. Elizabeth Sanders, Dr. Sara Kover, and Dr. Kathleen Meeker, who offered their time, talents, and support throughout the development of this work. Thank you for your guidance and mentorship. I would also like to thank my colleagues and research teammates, Bailey Allred, Lyvinna Lee, and Chi Biak, for their commitment and efforts in gathering this data for the UW Reading Development Project. Most importantly, I would like to express my endless gratitude to the students, families, and teachers who participated in this project with the vision of improving literacy instruction for all students with disabilities .

Dedication

This work is dedicated to my partner, who has never once doubted my abilities and has always encouraged me to pursue my dreams, and to my children, who have only ever known their mother as a graduate student. This work belongs to all of us.

Table of Contents

List of Tables

List of Figures

CHAPTER ONE: Introduction and Statement of the Problem

Our 33rd President Harry S. Truman is purported to have popularized the phrase *"if you can read this, thank a teacher."* Although the exact source of this quote cannot be identified, the connection between reading, literacy, and education is ubiquitous in our culture. Literacy is prioritized in many families of students with and without disabilities (Biggs et al., 2023; Lynch et al., 2006) and viewed as key to educational attainment and independence (Seidenberg, 2017). But what about students who cannot read? For students who struggle in literacy learning, especially students with intellectual and developmental disabilities (IDD), the existing literature extensively documents trends in underachievement (Wei et al., 2011; 2015), the use of intervention (Afacan et al., 2018), and strategies for delivering instruction (e.g. prompting, scripted lessons, time delay) (Alquiraini & Rao, 2020; Janho dit Hreich et al., 2024). However, despite many years of research exploring literacy methods, students with extensive support needs (ESN) are still limited in their access to quality reading instruction (Hunt et al., 2022; Lindstrom & Lemons, 2021) and often excluded from the general education curriculum (Agran et al., 2020; Toews & Kurth, 2019). By definition, intellectual and developmental disabilities is an umbrella term used to address a variety of developmental conditions that result in the need for communicative, adaptive, academic, and social support across the lifespan. Because individuals with IDD may have more extensive support needs[1], many are denied the opportunity to develop critical literacy skills throughout their educational journeys.

[1] The abbreviations for intellectual and developmental disabilities (IDD) and extensive support needs (ESN) will be used in combination throughout this work. Both terms reference individuals with various medical or educational diagnoses who require additional environmental supports for communication, leisure, and independence.

History of Achievement in Reading & Literacy for Students with IDD

Over the last two decades, research on reading and literacy outcomes for students with IDD has documented a consistent trend of underperformance on traditional measures of reading achievement. In the early 2000s, Katims (2001) assessed the literacy performance of students with IDD across elementary, middle, and high-school levels to measure how students performed compared to measures of "minimum literacy" (p. 364). Katims' (2001) defined minimum literacy as a students' ability to engage with the informative and communicative functions of print at a kindergarten level in the areas of decoding, comprehension, encoding, and writing. From their findings, 41% of students with IDD demonstrated minimum literacy in *one* area, and only 22% of participants demonstrated minimum literacy levels in all four areas.

Ten years later, Wei and colleagues (2011) grouped students by eligibility label and modeled longitudinal growth trajectories of reading achievement for students with disabilities. Wei et al. (2011) used a nationally representative sample of students with disabilities between the ages of 7 and 17 and charted the growth in individual word reading and short-passage comprehension using standardized achievement tests. Students with intellectual disability were the lowest performing disability group on both measures. Wei and others (2015) later replicated these findings in a group of elementary-aged students with autism and found that students' comprehension skills declined overtime. Findings from these studies show that during the early literacy period, students with IDD are not meeting expectations for decoding and reading comprehension on standardized measures.

Most recently, Afacan and Wilkerson (2022) explored levels of reading proficiency for students with IDD as measured by state testing results. This study compared the distribution of scores for 5th and 8th graders with IDD participating in either general statewide reading

assessments or statewide alternate assessments. Reading proficiency scores are distributed into advanced, proficient, basic, and minimal levels, which reflect a span of student performances ranging from deep understanding of tested content without instructional support to emerging understanding of content with significant support. Afacan and Wilkerson (2022) found that, when accessing the general education assessment, the majority of 5th grade (77.6%) and 8th grade students (86%) with IDD demonstrated minimal proficiency levels in reading. When compared to performance on the statewide alternate assessments, a slim majority of 5th students (35.9%) performed in the proficient category and by the 8th grade even fewer students (30.5%) maintained a score in the proficient category (Table 2, p. 202).

Taken together, these studies, Katims (2001), Wei et al. (2011; 2015), and Afacan and Wilkerson (2022), replicate the grim picture of reading achievement for students with IDD. Although these findings seem grounded in deficit-oriented approaches to learning for students with IDD, the intention of reviewing these findings is to highlight a history of educational injustices experienced by students with IDD.

Potential Barriers to Literacy Achievement

Because other longitudinal works have documented that students with IDD can show progress in literacy learning when given access to high quality instruction (see reviews Afacan et al., 2018; Dessemontet et al., 2019; Toews et al., 2021), it is important to consider how educational policy, contextual factors, and instructional opportunities have created barriers for students' literacy development (Copeland & Keefe, 2019; Toews & Kurth, 2019).

Educational Policy & Instructional Quality

After the introduction of IDEA (1994), subsequent policies that centered on achievement, such as No Child Left Behind (NCLB, 2001) and Every Student Succeeds Act (ESSA, 2015),

have shaped the focus and purpose of literacy instruction for students with disabilities (Wakeman et al., 2007). When comparing performance on high stakes reading assessment initiated by NCLB, Gilmour and colleagues (2019) calculated that students with disabilities are about 3 years behind in reading achievement when compared to peers who are not identified as disabled. The authors cite concerns that given low scores on reading achievement nationally, students with disabilities are likely even further behind. Additionally, the authors posit that the reading gap can be partially attributed to ineffective reading instruction for students with disabilities and advocate for further research into implementation of evidence-based practices and high-quality instruction in schools (Gilmour et al., 2019). This research highlights the disconnect between research, policy, and practice and the need for further research into the implementation of high-quality instruction for students with IDD to demonstrate progress in the general education curriculum (Gilmour et al., 2019; Wakeman et al., 2007).

For students with IDD, many have wrestled with the tension that general curriculum *access* does not always equate with *meaningful progress*. In 2017, *Endrew V. Douglas County* brought this conflict to the forefront by exploring the legal implications of the incongruency in how educators, families, and schools define meaningful progress in academics for students with ESN. In the majority opinion, the court specified that children with ESN should be given the opportunity to meet challenging objectives and demonstrate more than *de minis* progress. *Endrew* has become a call to support students with IDD in ways that achieve maximum educational benefit and demonstrate progress in the grade-level curriculum. While the case decision does not specifically cite literacy achievement, the conflicts broached in *Endrew* represent historical tensions in education between misaligned expectations for student learning

across stakeholders (Yell & Bateman, 2017) and divergent beliefs about students' abilities to access academic content areas, including literacy (Wakeman et al., 2007).

Presumptions of Incompetence for Learners with IDD

Presumptions of incompetence held by many educators presents a second barrier to literacy achievement for students with IDD. Kliewer and Biklen (2001) argue that cultural definitions of literacy are rooted in the ability to demonstrate a narrowly defined set of skills. Because those definitions of literacy depend on traditional engagement with reading, writing, and printed text, individuals with disabilities are often presumed to be incompetent, meaning that given their disability it is assumed that they are unable to become literate. As a result, many children and adults with IDD are either denied opportunities to participate in literacy activities or discredited and devalued in their literate accomplishments (Kliewer et al., 2006). Keefe and Copeland (2011) explain how "readiness models" (p. 95) perpetuate the literacy gatekeeping by excluding students with disabilities who do not demonstrate traditional literacy behaviors and prohibiting them from accessing literacy instruction. Barriers connected to presumptions of incompetence for students with IDD persist in educator beliefs about the purpose of literacy instruction (Ruppar et al., 2015), access to meaningful literacy instruction (Keefe & Copeland, 2011; Yell & Bateman, 2017), and narrow definitions of how students can engage in literacy (Kliewer & Biklen, 2001; Kliewer et al., 2006).

Literacy, Agency, & Ableism

Similar to presumptions of incompetence, access to literacy learning for students with IDD is limited by ableism within the educational system. Ableism perpetuates the belief that difference and disability are abnormal, rather than expected variation amongst individuals (Baglieri & Shapiro, 2017). Keefe and Copeland (2011) argue that, as a result of ableism,

individuals with IDD, are "the last group of people routinely denied opportunities for literacy instruction" (p. 92). Literacy is viewed as a foundational tool for learning, which leads to self-empowerment and self-determination by disrupting systems of oppression (Keefe & Copeland, 2011; Kliewer et al., 2006; Morgan et al., 2011; Muhammad & Mosley, 2021). A history of oppression can be documented in limiting access to literacy for historically marginalized groups including people of color, women, and those emigrating to the United States (Keefe & Copeland, 2011). Likewise, students with IDD are often marginalized within our current educational system by limiting access to high-quality instruction, inclusive settings, and systems of teacher accountability (Copeland & Keefe, 2019; Lalvani, 2015). These practices have allowed ableism and presumptions of incompetence to persist among educators and shape the quality of literacy instruction for students with IDD (Kliewer et al., 2006; Ruppar; 2017).

Access to Inclusive Literacy Instruction

Prior research has also documented that students with extensive support needs, including IDD, are less likely to have access to inclusive instruction in the general education environment (Brock, 2018; Kurth et al., 2014; Morningstar et al., 2017). Morningstar and colleagues evaluated national placement data from 2004-2014 and found that students with intellectual disability, deaf-blindness, and multiple disabilities typically spent less than 40% of the day in general education settings. Likewise, Kurth and colleagues (2014) demonstrated that students with low-incidence disabilities were disproportionately placed in the most restrictive environments, such as segregated schools. Many scholars have drawn connections between policy, ableism, and access to inclusive education for students with IDD (Agran et al., 2020; Morningstar et al., 2017; Ryndak et al., 2013). These themes likely extend to inclusive literacy instruction as other scholars have documented beliefs about competence (Copeland & Keefe,

2019; Kliewer, 2006), teacher training and preparedness (Zagona et al., 2017; 2021), and lack of staff and resources (Ruppar et al., 2015) as specific barriers for students with ESN. All in all, our understanding of inclusive literacy instruction is limited for students with IDD. While we have a wealth of research-based interventions and multi-component curriculum for students with IDD (for reviews see Afacan et al., 2018; Browder et al., 2006; Dessemontet et al., 2019; Roberts et al., 2013), there is a dearth of research documenting the effects of inclusive instruction on reading development for students with IDD. Scholars have issued a call to action to move beyond segregated interventional research and further explore literacy learning in inclusive instructional contexts for students with ESN (Copeland & Keefe, 2019; Hunt, 2019; Toews & Kurth, 2019).

Defining the Purpose of this Inquiry

As reviewed here, prior work on the reading and literacy development of students with IDD has documented limited skill development (Katims, 2001), longitudinal predictions of underperformance (Wei et al., 2011; 2015), and failure to meet the standard of reading proficiency on both general and alternate state assessments (Afacan & Wilkerson, 2022). These outcomes are connected to educational policies that dictate the content, focus, and delivery of instruction for students with IDD (Copeland & Keefe, 2019; Wakeman et al., 2007; Yell & Bateman, 2017). Other literature has defined the ways in which cultural beliefs about competence (Kliewer & Biklen, 2001; Kliewer et al., 2006) and ability (Agran et al., 2020; Ruppar, 2017) have limited educational opportunities to access meaningful literacy instruction for students with IDD (Copeland & Keefe, 2019; Keefe & Copeland, 2011; Toews & Kurth, 2019). Furthermore, evidence shows a persistence of exclusion from the general education curriculum for students with IDD (Brock, 2018; Kurth et al., 2014; Morningstar et al., 2017;

Toews & Kurth, 2019). Holistically, these interconnecting policies and practices have limited educational opportunities and resulted in lower rates of literacy proficiency among students and adults with IDD (Afacan & Wilkerson, 2018). This warrants additional exploration into the development of early literacy skills for students with IDD to identify the role of instruction and educational placement on the trajectory of literacy and language learning over time.

Previous analyses of educational settings have documented the quality of instruction available in segregated settings (Hunt et al., 2022; Lindstrom & Lemons, 2021; Ruppar et al., 2018) and teachers' beliefs about literacy learning for students with IDD (Ruppar et al., 2015; Roberts et al., 2024; Krishnan, 2021), but very few analyses have explored how inclusive learning environments influence the development of early literacy learning (Hudson et al., 2014; Hunt et al., 2020). The purpose of this inquiry is to explore teacher conceptualizations of their literacy instruction and the influence of educational placements on the development of reading and language skills for young students with IDD. While we have evidence supporting the benefits of inclusive instruction (Mansouri et al., 2022), existing barriers in classrooms, schools, and communities still prohibit many students from participating meaningfully in grade-level literacy instruction. This study aims to document the observed effects of access to inclusive instruction on the natural development of reading and language skills during the early years of literacy development.

CHAPTER TWO: Literature Review & Conceptual Framework

Classroom ecologies represent a complex and dynamic network of interactions between teachers, students, and curriculum. All three are often interdependent, with interactions and relationships shaped by a multitude of beliefs, lived experiences, and contingencies (Annamma & Morrison, 2018). In seeking to understand how classroom ecologies shape literacy learning for students with IDD, this chapter will present a review of the relevant literature on the conceptual framings of literacy, the connection between teacher beliefs and practices, and the influences of educational contexts on student learning. The first section will explore conceptualization of literacy in the existing literature and familiarize readers with how functional, traditional, and expansive framings of literacy for students with IDD have developed over time. The second section will review theoretical frameworks for understanding how teacher knowledge and beliefs shape instructional practice. The third section delves into literacy environments and how educational placements for students with IDD define contexts for student literacy learning. Finally, this chapter will conclude with a summarization of prior research, the purpose of this study, and my proposed research questions.

Conceptual Framings of Literacy for Students with IDD

Across the existing literature on reading instruction for students with IDD, the field has broadly explored three conceptualizations of the purpose for literacy instruction: functional, traditional, and expansive. Characterizing each of these approaches is central to understanding the influence of teacher beliefs on reading instruction (Roberts, Wilhelm, et al., 2024; Ruppar et al., 2015) and understanding the interplay between educational contexts and literacy outcomes (Lopez et al., 2017; Toews & Kurth, 2019). In this section, I will review how literacy for individuals with IDD has been conceptually framed in the relevant literature within the field of education.

Establishing a clear overview of the varied conceptual approaches to literacy for learners with IDD in the extant literature will support later arguments connecting instruction and literacy outcomes later in this chapter.

Functional Literacy

Early work on reading instruction for students with IDD focused on building skills for independence in adulthood. Functional academic curricula prioritize daily living, consumer, and vocational skills with the belief that these skills are central to independent community participation (Brown et al., 1976). Within the framework of functional academics, functional literacy skills include sight word recognition, concepts of print, or adaptive learning targets (e.g., recipes, warning labels, community signs) that are characterized as contextualized, generalizable, and meaningful learning for independence in the activities of daily living (Ayres et al., 2011; Browder & Xin, 1998). Proponents for functional literacy argue that students with IDD have limited time to demonstrate progress in traditional K-12 schooling and that functional curricula concentrate instructional time on foundational concepts that maximize individual benefit (Ayres et al., 2011). Functional conceptualizations of literacy prioritize the mastery of a narrow set of discrete learning targets as critical to future independence as adults.

In an early review of the extant literature, Browder and Xin (1998) investigated the application of sight word instruction as a strategy for teaching functional reading for students with IDD. Browder and Xin (1998) reviewed 48 studies to determine that a variety of teaching strategies, such as prompting, error correction, and application (defined as connecting words to real environments or materials), were effective methods for sight word instruction. Most of the reviewed studies used single case designs and very few of the identified studies included more than 10 target words in their interventions. Although these intervention studies demonstrated

growth, learning targets were set at objectively low standards in comparison to grade level norms and required long stretches of repetitive instruction. Browder and Xin (1998) cited that some limitations within this body of work were the absence of generalization phases for learning targets and minimal opportunities to explore application and comprehension of target words. Browder and Xin's (1998) work was influential in demonstrating the benefits of explicit instruction. However, others argue that functional approaches deny opportunities by limiting the scope of literacy instruction and perpetuating readiness-models that exclude students with extensive support needs (Kliewer & Biklen, 2001). Literacy instruction emphasizing sight word instruction often leaves students unprepared to transfer decontextualized, single word reading skills to authentic texts or real-life scenarios.

When considering the preponderance of functional literacy instruction in early research for students with IDD, it is also relevant to consider the broader educational trend towards whole language instruction in the early 1990s (for a review see Stahl & Miller, 1989). Functional literacy may be partially derived from cultural beliefs about the best methods for literacy instruction. This is evidenced in the number of studies replicating instruction in whole-word sight reading and vocabulary recognition (Browder et al., 2006; Browder & Xin, 1998). However, as literacy practices began to shift back towards phonics-based instruction, a focus on functional academics lingered for students with IDD. This is likely a result of lowered expectations for students with IDD. Conceptualizations of functional literacy are anchored in presumptions of incompetence (Keefe & Copeland, 2011), a sense of educational urgency (Ayres et al., 2011), and an emphasis on independence in adulthood (Browder & Xin, 1998). In the early IDEA era, functional academics centered on specially designed instruction for demonstrating educational progress and inadvertently narrowed the curriculum for students. Educators relied on

faulty ableist assumptions that students with IDD were unlikely to benefit from learning higher order literacy skills, such as inferencing or critical thinking, and did not provide opportunities to engage in literacy outside of functional academics. Unfortunately, some educators still prioritize functional literacy skills at the early elementary age, but there is no research documenting how functional literacy framings impact development when experienced over many academic years.

Traditional Literacy

In beginning to transition away from whole word reading in the early 2000s, scholars in the field of early literacy began to explore the elements of effective reading instruction. The National Reading Panel (NRP, 2000) and other early literacy works (Adams, 1990) reported that the most effective methods for reading instruction included instruction in phonemic awareness, phonics, fluency, vocabulary, and comprehension. These findings aligned with traditional literacy frameworks, like the "Simple View of Reading", that approach skilled reading as a product of print recognition and language comprehension (Gough & Tumner, 1984). Other conceptual models, like Hollis Scarborough's (2001) "Strands of Early Literacy" framework, expanded on this idea to consider the complex network of skills that contribute to literacy development, in addition to print recognition, including oral language, phonological awareness, comprehension, and lived experience. With a new focus on the science of reading emerging in the field of literacy instruction, scholars in special education shifted their focus away from functional literacy and began applying research-based models of literacy instruction to students with IDD (Allor et al., 2009; Browder et al., 2006).

Browder and colleagues (2006) conducted a comprehensive review of the literature to determine the alignment of reading instruction for individuals with IDD with the principal components outlined in the NRP. They evaluated 128 research studies for the use of evidence-

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Literacy, Agency, & Ableism

Similar to presumptions of incompetence, access to literacy learning for students with IDD is limited by ableism within the educational system. Ableism perpetuates the belief that difference and disability are abnormal, rather than expected variation amongst individuals (Baglieri & Shapiro, 2017). Keefe and Copeland (2011) argue that, as a result of ableism,

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Access to Inclusive Literacy Instruction

Prior research has also documented that students with extensive support needs, including IDD, are less likely to have access to inclusive instruction in the general education environment (Brock, 2018; Kurth et al., 2014; Morningstar et al., 2017). Morningstar and colleagues evaluated national placement data from 2004-2014 and found that students with intellectual disability, deaf-blindness, and multiple disabilities typically spent less than 40% of the day in general education settings. Likewise, Kurth and colleagues (2014) demonstrated that students with low-incidence disabilities were disproportionately placed in the most restrictive environments, such as segregated schools. Many scholars have drawn connections between policy, ableism, and access to inclusive education for students with IDD (Agran et al., 2020; Morningstar et al., 2017; Ryndak et al., 2013). These themes likely extend to inclusive literacy instruction as other scholars have documented beliefs about competence (Copeland & Keefe,

2019; Kliewer, 2006), teacher training and preparedness (Zagona et al., 2017; 2021), and lack of staff and resources (Ruppar et al., 2015) as specific barriers for students with ESN. All in all, our understanding of inclusive literacy instruction is limited for students with IDD. While we have a wealth of research-based interventions and multi-component curriculum for students with IDD (for reviews see Afacan et al., 2018; Browder et al., 2006; Dessemontet et al., 2019; Roberts et al., 2013), there is a dearth of research documenting the effects of inclusive instruction on reading development for students with IDD. Scholars have issued a call to action to move beyond segregated interventional research and further explore literacy learning in inclusive instructional contexts for students with ESN (Copeland & Keefe, 2019; Hunt, 2019; Toews & Kurth, 2019).

Defining the Purpose of this Inquiry

As reviewed here, prior work on the reading and literacy development of students with IDD has documented limited skill development (Katims, 2001), longitudinal predictions of underperformance (Wei et al., 2011; 2015), and failure to meet the standard of reading proficiency on both general and alternate state assessments (Afacan & Wilkerson, 2022). These outcomes are connected to educational policies that dictate the content, focus, and delivery of instruction for students with IDD (Copeland & Keefe, 2019; Wakeman et al., 2007; Yell & Bateman, 2017). Other literature has defined the ways in which cultural beliefs about competence (Kliewer & Biklen, 2001; Kliewer et al., 2006) and ability (Agran et al., 2020; Ruppar, 2017) have limited educational opportunities to access meaningful literacy instruction for students with IDD (Copeland & Keefe, 2019; Keefe & Copeland, 2011; Toews & Kurth, 2019). Furthermore, evidence shows a persistence of exclusion from the general education curriculum for students with IDD (Brock, 2018; Kurth et al., 2014; Morningstar et al., 2017;

Toews & Kurth, 2019). Holistically, these interconnecting policies and practices have limited educational opportunities and resulted in lower rates of literacy proficiency among students and adults with IDD (Afacan & Wilkerson, 2018). This warrants additional exploration into the development of early literacy skills for students with IDD to identify the role of instruction and educational placement on the trajectory of literacy and language learning over time.

Previous analyses of educational settings have documented the quality of instruction available in segregated settings (Hunt et al., 2022; Lindstrom & Lemons, 2021; Ruppar et al., 2018) and teachers' beliefs about literacy learning for students with IDD (Ruppar et al., 2015; Roberts et al., 2024; Krishnan, 2021), but very few analyses have explored how inclusive learning environments influence the development of early literacy learning (Hudson et al., 2014; Hunt et al., 2020). The purpose of this inquiry is to explore teacher conceptualizations of their literacy instruction and the influence of educational placements on the development of reading and language skills for young students with IDD. While we have evidence supporting the benefits of inclusive instruction (Mansouri et al., 2022), existing barriers in classrooms, schools, and communities still prohibit many students from participating meaningfully in grade-level literacy instruction. This study aims to document the observed effects of access to inclusive instruction on the natural development of reading and language skills during the early years of literacy development.

CHAPTER TWO: Literature Review & Conceptual Framework

Classroom ecologies represent a complex and dynamic network of interactions between teachers, students, and curriculum. All three are often interdependent, with interactions and relationships shaped by a multitude of beliefs, lived experiences, and contingencies (Annamma & Morrison, 2018). In seeking to understand how classroom ecologies shape literacy learning for students with IDD, this chapter will present a review of the relevant literature on the conceptual framings of literacy, the connection between teacher beliefs and practices, and the influences of educational contexts on student learning. The first section will explore conceptualization of literacy in the existing literature and familiarize readers with how functional, traditional, and expansive framings of literacy for students with IDD have developed over time. The second section will review theoretical frameworks for understanding how teacher knowledge and beliefs shape instructional practice. The third section delves into literacy environments and how educational placements for students with IDD define contexts for student literacy learning. Finally, this chapter will conclude with a summarization of prior research, the purpose of this study, and my proposed research questions.

Conceptual Framings of Literacy for Students with IDD

Across the existing literature on reading instruction for students with IDD, the field has broadly explored three conceptualizations of the purpose for literacy instruction: functional, traditional, and expansive. Characterizing each of these approaches is central to understanding the influence of teacher beliefs on reading instruction (Roberts, Wilhelm, et al., 2024; Ruppar et al., 2015) and understanding the interplay between educational contexts and literacy outcomes (Lopez et al., 2017; Toews & Kurth, 2019). In this section, I will review how literacy for individuals with IDD has been conceptually framed in the relevant literature within the field of education.

Establishing a clear overview of the varied conceptual approaches to literacy for learners with IDD in the extant literature will support later arguments connecting instruction and literacy outcomes later in this chapter.

Functional Literacy

Early work on reading instruction for students with IDD focused on building skills for independence in adulthood. Functional academic curricula prioritize daily living, consumer, and vocational skills with the belief that these skills are central to independent community participation (Brown et al., 1976). Within the framework of functional academics, functional literacy skills include sight word recognition, concepts of print, or adaptive learning targets (e.g., recipes, warning labels, community signs) that are characterized as contextualized, generalizable, and meaningful learning for independence in the activities of daily living (Ayres et al., 2011; Browder & Xin, 1998). Proponents for functional literacy argue that students with IDD have limited time to demonstrate progress in traditional K-12 schooling and that functional curricula concentrate instructional time on foundational concepts that maximize individual benefit (Ayres et al., 2011). Functional conceptualizations of literacy prioritize the mastery of a narrow set of discrete learning targets as critical to future independence as adults.

In an early review of the extant literature, Browder and Xin (1998) investigated the application of sight word instruction as a strategy for teaching functional reading for students with IDD. Browder and Xin (1998) reviewed 48 studies to determine that a variety of teaching strategies, such as prompting, error correction, and application (defined as connecting words to real environments or materials), were effective methods for sight word instruction. Most of the reviewed studies used single case designs and very few of the identified studies included more than 10 target words in their interventions. Although these intervention studies demonstrated

growth, learning targets were set at objectively low standards in comparison to grade level norms and required long stretches of repetitive instruction. Browder and Xin (1998) cited that some limitations within this body of work were the absence of generalization phases for learning targets and minimal opportunities to explore application and comprehension of target words. Browder and Xin's (1998) work was influential in demonstrating the benefits of explicit instruction. However, others argue that functional approaches deny opportunities by limiting the scope of literacy instruction and perpetuating readiness-models that exclude students with extensive support needs (Kliewer & Biklen, 2001). Literacy instruction emphasizing sight word instruction often leaves students unprepared to transfer decontextualized, single word reading skills to authentic texts or real-life scenarios.

When considering the preponderance of functional literacy instruction in early research for students with IDD, it is also relevant to consider the broader educational trend towards whole language instruction in the early 1990s (for a review see Stahl & Miller, 1989). Functional literacy may be partially derived from cultural beliefs about the best methods for literacy instruction. This is evidenced in the number of studies replicating instruction in whole-word sight reading and vocabulary recognition (Browder et al., 2006; Browder & Xin, 1998). However, as literacy practices began to shift back towards phonics-based instruction, a focus on functional academics lingered for students with IDD. This is likely a result of lowered expectations for students with IDD. Conceptualizations of functional literacy are anchored in presumptions of incompetence (Keefe & Copeland, 2011), a sense of educational urgency (Ayres et al., 2011), and an emphasis on independence in adulthood (Browder & Xin, 1998). In the early IDEA era, functional academics centered on specially designed instruction for demonstrating educational progress and inadvertently narrowed the curriculum for students. Educators relied on

faulty ableist assumptions that students with IDD were unlikely to benefit from learning higher order literacy skills, such as inferencing or critical thinking, and did not provide opportunities to engage in literacy outside of functional academics. Unfortunately, some educators still prioritize functional literacy skills at the early elementary age, but there is no research documenting how functional literacy framings impact development when experienced over many academic years.

Traditional Literacy

In beginning to transition away from whole word reading in the early 2000s, scholars in the field of early literacy began to explore the elements of effective reading instruction. The National Reading Panel (NRP, 2000) and other early literacy works (Adams, 1990) reported that the most effective methods for reading instruction included instruction in phonemic awareness, phonics, fluency, vocabulary, and comprehension. These findings aligned with traditional literacy frameworks, like the "Simple View of Reading", that approach skilled reading as a product of print recognition and language comprehension (Gough & Tumner, 1984). Other conceptual models, like Hollis Scarborough's (2001) "Strands of Early Literacy" framework, expanded on this idea to consider the complex network of skills that contribute to literacy development, in addition to print recognition, including oral language, phonological awareness, comprehension, and lived experience. With a new focus on the science of reading emerging in the field of literacy instruction, scholars in special education shifted their focus away from functional literacy and began applying research-based models of literacy instruction to students with IDD (Allor et al., 2009; Browder et al., 2006).

Browder and colleagues (2006) conducted a comprehensive review of the literature to determine the alignment of reading instruction for individuals with IDD with the principal components outlined in the NRP. They evaluated 128 research studies for the use of evidence-

based practices and quality indicators of single-case research. Their findings reported that sight word and vocabulary acquisition were the most frequently occurring components of reading instruction in the included studies. A small portion of the reviewed studies included instruction in phonics or phonemic awareness, which is often highlighted as a critical component of early literacy instruction (Adams, 1990; NRP, 2000). Browder and colleagues (2006) concluded their review by citing the historical successes of functional literacy instruction but also invited researchers and practitioners to incorporate more research-based literacy practices like phonics, comprehension, and oral fluency into their work.

Traditional frameworks of literacy instruction propose that students with IDD should also be provided with effective, evidence-based reading instruction aimed at mastering the essential skills for fluent reading and comprehension. This shift coincided with the introduction of educational reforms like No Child Left Behind (NCLB), which was the first piece of legislation to specify the need for progress in the general education curriculum for students with disabilities (Jackson et al., 2008; Wakeman et al. 2007). In 2009, Browder and colleagues introduced a conceptual model for literacy instruction for students with IDD. This model proposed that students would benefit from exposure to a variety of literacy opportunities (e.g. adapted books, technology supports, interactive book reading) while also targeting individual skills for independent reading (e.g. phonics, vocabulary, comprehension). This is also referred to in the literature as multicomponent reading instruction (Afacan & Wilkerson, 2018). Rather than focusing on functional activities from the start, literacy instruction should provide scaffolded learning opportunities to expose students to meaningful texts, develop oral language, increase independent decoding, and transfer skills to applied settings as students progress through the K-12 curricula (Allor et al., 2009; Browder et al., 2009). Browder and colleagues' (2009)

framework specified that students with IDD should be provided with access to instruction that is evidence-based and anchored to progress in the general education curriculum; however, the implication is that specially designed literacy instruction is still preferred to general curriculum access for learners with ESN.

In seeking to connect multicomponent literacy instruction and educational outcomes, Afacan and Wilkeson (2018) explored the characteristics and outcomes of multicomponent literacy instruction in seven studies published between 2008 and 2014. Based on this review, students with IDD demonstrated growth on measures of sight word reading, phonics, comprehension, or fluency following multicomponent interventions. Similar to readers accessing the general education curriculum, Afacan and Wilkerson's (2018) findings provide evidence of the effectiveness of implementing evidence-based literacy instruction for learners with IDD. Although this review identified a relatively small sample, it supports the claim that scholars in the field are advocating for fuller educational opportunities for students, by holding higher expectations for student learning and integrating core academics (Afacan & Wilkerson, 2018; Browder et al., 2009; Courtade et al., 2012).

By creating opportunities for curriculum access, traditional literacy frameworks encourage educators to align expectations with grade-level standards and provide skill-based intervention to increase individual reading achievement (Browder, 2009). In traditional frames of literacy, the purpose of literacy instruction is to develop student's skills to meet measurable, observable markers of reading proficiency as determined by curricula, standards, and assessments. Traditional literacy frameworks advance the quality of literacy instruction available to students with IDD. Rather than focusing on isolated word-reading skills, students are provided instruction aimed at developing skills for accessing texts and generalizing decoding skills.

Although this is a shift away from functional literacy, students with IDD are still experiencing barriers to accessing effective literacy instruction (Agran et al., 2020), inclusive literacy instruction (Afacan & Wilkerson, 2018; Toews & Kurth, 2019), and demonstrating progress in reading achievement (Afacan & Wilkerson, 2022). Given that students are still demonstrating low rates of literacy achievement (Afacan & Wilkerson, 2022), it is unclear whether special educators have failed to implement effective evidence-based strategies at a large scale or if there are other limiting contextual factors at work.

Expansive Literacy

While traditional frames of literacy instruction offer promise for developing the essential skills to access text independently, other scholars are seeking to understand how learners with IDD engage in collaborative meaning making. Recent works in literacy have drawn upon conceptual frameworks viewing literacy as a socio-cultural practice (Keefe & Copeland, 2011; Koppenhaver et al., 1991; Street, 1993) and expanded our thinking about literacy for students with IDD. Expansive framings of literacy are drawn from extant work in multiliteracies, learner engagement, and authentic pedagogy (Cervetti et al., 2006; Cope & Kalantzis, 2015). Expansive literacy is a social practice that incorporates multiple modes of text engagement (Krishnan, 2021) and meaning making while extending the boundaries of what constitutes competence in literacy (Kleekamp, 2020). Learners connect to their communities and lived experiences (Street, 1988; 2003), use multimodal or digital texts to support learning (Cervetti et al., 2006), and identify and synthesize applications of knowledge during literacy events (Cope & Kalantzis, 2015). Although these pedagogical framings have been used in critical and multiliteracies literature, an expansive frame of literacy for students with IDD is a paradigm shift from functional and traditional orientations.

By positioning literacy as a sociocultural act, expansive literacy acknowledges the individual contributions of knowledge, experience, and voice as situated in collaborative learning exchanges between readers, texts, and communities. Muhammad (2020) explores the idea of historically responsive literacy as an avenue for identity development and reclamation of intellectual agency for Black students. In a similar way, expansive literacy for disabled students challenges presumptions of incompetence and asserts a right to communication and connection in a social community for individuals with IDD (Keefe & Copeland, 2011; Krishnan, 2021). As Cope and Kalantzis (2015) explain, the "learner becomes a cognitive agent, building mental models of the world for themselves" (p.11). Roberts and colleagues (2025) documented a framework of expansive home literacy practices for young children with IDD. Families shared that they built upon a foundation of traditional texts and literacy skills to encourage child engagement in mean-making through the arts, the natural world, and cultural communities (Roberts et al., 2025). As literacy instruction moves beyond "readiness-models" (Koppenhaver et al., 1991) and traditional frameworks, literacy instruction that aligns to expansive conceptualizations of literacy can encourage access to inclusive instruction by claiming intellectual agency and resisting deficit norms (Kliewer et al., 2006; Mohammed & Moseley, 2021; Roberts et al., 2025). These conceptualizations of literacy can be avenues for empowering educators to provide instruction in interdependent networks (Krishnan, 2021) and literacy communities that simultaneously build skills and connections leading to the development of literate citizenship (Kliewer et al., 2006). As our understanding of literacy engagement for students with IDD begins to extend to expansive literacies, like oral language, communication, and shared meaning-making, there is a compelling rationale for research that documents the effects of expansive approaches on student achievement. Further investigation into how

educators' beliefs and knowledge align with these frames of literacy for students with ESN, will offer insight into how different conceptualizations of literacy yield changes in teachers' instructional design and students' learning opportunities.

Teacher Beliefs, Practices, & Literacy Instruction

The practice of teaching, or pedagogy, is sometimes described as a two-stage process in which teacher cognition leads to observable behaviors with the ultimate goal of transmitting knowledge to learners (Fang, 1996; Shulman, 1986). Early research in this area focused on the unidirectional transmission of knowledge from teacher to student, and later scholars began to explore the interactive and cyclical relationship between student and teacher behaviors during instruction (Brophy & Good, 1986; Fang, 1996). This research has explored teacher cognition and the connection between knowledge, beliefs, and practices and, in turn, their influence on student learning (see Fang, 1996 for review). Extending this work, I will theorize how special educator's beliefs about literacy and students with IDD guide their instructional decision making and practices in the classroom.

"The Missing Paradigm"

Research on teacher cognition has stemmed from an interest in defining the relationship between teacher effectiveness and student outcomes (Clark & Peterson, 1986). The "Missing Paradigm" (Shulman, 1986b) seeks to understand the internal cognitive processes that guide the translation of teacher knowledge and its transmission to students. Shulman (198b) poses the following questions as central to this paradigm: "Where do teacher explanations come from? How do teachers decide what to teach, how to represent it, how to question students about it and how to deal with the problems of misunderstanding?" (p.8). These questions pose the need for a

deeper understanding of how teachers' conceptual understandings, personal beliefs, and theoretical orientations shape their pedagogy.

Clark and Peterson (1986) theorized that teaching is a series of sequential thought to action processes, in which unobservable processes of cognition lead directly to observed actions in the classroom. This model centers teacher cognition and differentiates between thoughts related to planning, interactive decision-making, and systems of beliefs. While this model assumes planning and instructional decision-making to be unidirectional, Clark and Peterson (1986) contend that the observed effects of teaching in context (e.g., student behavior and achievement) provide feedback that shapes ongoing beliefs and thought processes. Clark and Peterson (1986) specify that contextual variables (i.e. physical settings, curriculums, and community) operate to either constrain or offer opportunities for teaching but positions them as separate from the thought-action contingency. In this model, attributions of student ability and a teacher's individual capacity for cognition and problem-solving during instructional decision-making are positioned as moderators of effectiveness. Prior research has examined these concepts within the research on reading instruction, and the debate between language and phonics based methodologies (Clark & Peterson, 1986; Fang, 1996; Lenski et al., 1998). After extensive review of the literature, Fang (1996) determined that teachers' theoretical beliefs, implicit understandings of students, and professional values shape their instructional practices and classroom environments. This warrants further exploration of special educators' beliefs about literacy instruction, specifically for students with ESN, and how their beliefs guide teacher cognition in practice.

Teacher Beliefs about Literacy Instruction for Students with ESN

Prior research in the field has examined the influence of special educators' beliefs about student ability, their definitions of literacy, and the purpose of literacy instruction of students with ESN (Roberts, 2013; Ruppar et al., 2011; Ruppar, 2015). These beliefs are also coupled with teachers' perceptions of the importance of literacy in their students' lives. Ruppar and colleagues (Ruppar et al., 2015) used qualitative interview and observation methodologies to investigate how teacher beliefs interacted with context to affect literacy instruction and decision making for secondary students with ESN. In this study, the participants were intentionally sampled to reflect contrasting approaches to literacy instruction. Their findings documented varied beliefs about the importance of individualization, integrating communication into instruction, and the importance of centering students' perspectives. Differences were also identified in special educators' attributions of learning, to internal or external causes, and their assumptions about students' abilities to learn. Ruppar and colleagues (2015) surmised that educators' belief systems and perceptions of the importance of literacy greatly influenced their decision making and instruction. As observed in this study, teachers' reported beliefs were observed to have direct influences on expectations and agency.

This research parallels earlier findings surveying teachers of students who communicate using augmentative and alternative communication (AAC) about their beliefs and preferences for types of literacy instruction (Ruppar et al., 2011). Educators showed a preference for teaching literacy "life-skills" in community contexts and routines (e.g., following schedules, reading menus, identifying signs; Ruppar et al., 2011) and less support for inclusive literacy instruction. While the majority of educators endorsed a belief that students with ESN can benefit from literacy instruction, disagreement was evident in their selection of instructional approaches.

Many reported a higher likelihood to teach sight words, letter sound correspondences, or picture schedules and relatively fewer endorsing a likelihood to teach decoding, spelling, or identifying text genres. While these studies have advanced our understanding of teacher beliefs about literacy for secondary students with ESN, it is important to examine if these patterns are reproduced amongst elementary educators. In each of these works, Ruppar and colleagues (2011; 2015) provide evidence that teacher beliefs and functional, traditional, or expansive framings of literacy have observable effects on decision making and expectations for how students with IDD should engage in literacy learning.

Beliefs about Student Learning

When engaging in planning for literacy instruction, teacher preferences for literacy approaches are also guided by their beliefs and knowledge of their students (Clark & Peterson, 1986; Ruppar et al., 2015). Using a grounded theory approach, Ruppar and colleagues examined how educator beliefs interact with contextual factors to influence instructional decision-making for students ESN. This model expanded on the Clark and Peterson's (1986) work by attributing a larger role to contextual features and integrating educator beliefs about themselves, student characteristics, and student ability into decision-making. Ruppar and colleagues' (2015) model suggests an interaction between the context and educator beliefs and a counter influence of beliefs about student and teaching ability as influencing context. Their model implies a dynamic process of interactions between contexts and educators' beliefs occur prior to instructional decision making about literacy instruction, rather than positioning teacher cognition as the only antecedent to action (Clark & Peterson, 1986). It is of note that none of the participants in this study taught literacy in inclusive settings, and while Ruppar and colleagues (2015) concluded

that contexts were less influential than beliefs, there is no opportunity for a comparison of beliefs across varied placements.

In later works, Ruppar (2017) illustrated connections observed between segregated learning environments and assumptions about student ability. Secondary students with ESN who communicate using AAC, demonstrate interfering behaviors, or are perceived as "low" were afforded less, or excluded completely from, opportunities to participate in meaningful literacy instruction. This trend was also documented in a survey sample of K-12 special educators (N = 69) who ranked cognitive ability and readiness skills as key factors in determining what literacy skills to teach. Teacher beliefs about the importance of literacy instruction are closely tied to teacher perceptions of student ability. These beliefs lead to expectations, which differ from beliefs in that they are predictions of future outcomes or events. As teachers make judgements about students' capacity for learning and students' literate futures, opportunities to learn are either intentionally created or systematically denied. Kliewer and colleagues (2006) cite presumptions of incompetence as a frequent barrier to literacy learning for individuals with IDD, meaning that due to their disability label teachers make assumptions that students with IDD are unlikely to engage with or benefit from literacy instruction. This "literate invisibility" (Kliewer et al., 2006; p. 172) stems from ableism and, by viewing the qualities of those with IDD as fixed and immutable, precludes teachers' from envisioning and instructing toward literate futures for their students.

In addition to *what* to teach, prior studies have documented that special educators' beliefs about their students also inform *how* and *where* they deliver literacy instruction (Roberts, 2013; Roberts, Hudson, et al., 2024; Ruppar, 2017; Ruppar et al., 2011; Ruppar et al., 2015). Scholars have noted that special educators tend to favor individualization in

their design for literacy instruction (Ruppar et al., 2015). This has been represented as a preference for functional, skills-based literacy instruction that limited to IEP goals (Roberts, Hudson, et al., 2024), and in special educators' beliefs that the content and type of instruction provided in the general education curriculum is not appropriate for learners with ESN (Ruppar et al., 2011). In contrast, using asset-based pedagogies such as centering student perspectives in activities like expressing opinions (Ruppar, 2015) or developing instruction based on student interests has been associated with educators providing more expansive literacy instruction (Roberts, Wilhelm, et al., 2024). Perceptions of students' communication abilities have also been highlighted as a factor in teachers' decision making about literacy instruction. Ruppar (2017) noted that verbal ability was often misused as a proxy for ability and led to the labeling of "high and low" students with ESN. These misattributions often lead to limited opportunities to participate in (Ruppar et al., 2015; Ruppar, 2017) or exclusion from literacy instruction (Kliewer et al., 2006; Kliewer and Biklen, 2001; Ruppar et al., 2011). In addition to their conceptualizations of literacy, special educators' beliefs about students with ESN act as filters for selecting content and strategies for instruction.

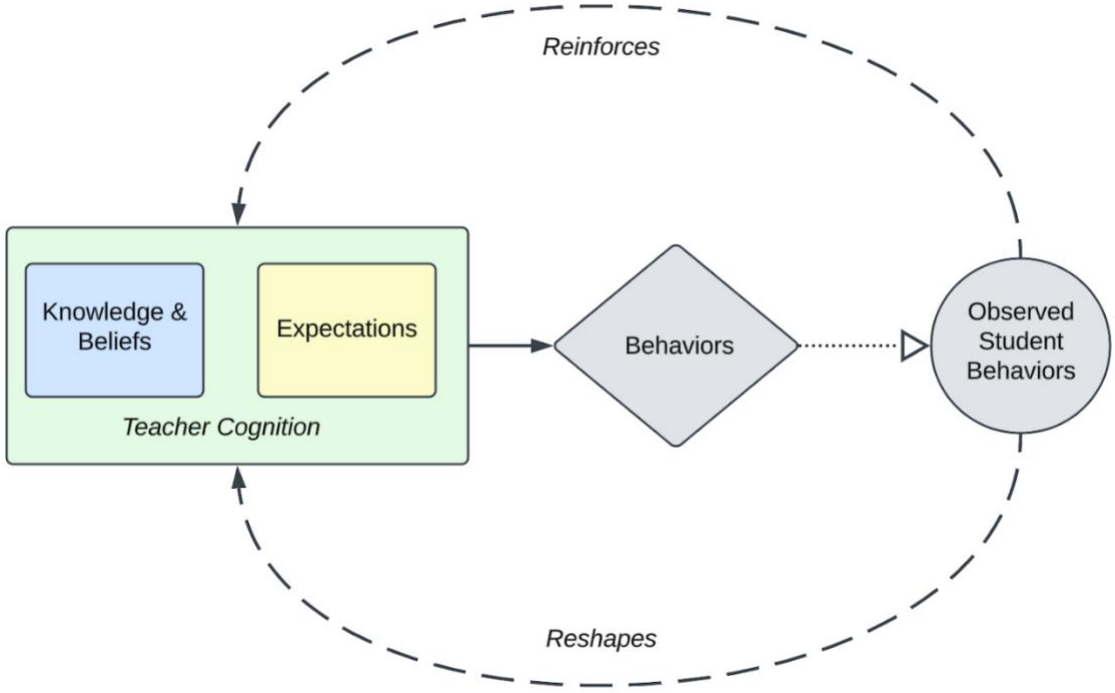
This literature has also documented that special educators' beliefs influence *where* literacy instruction is delivered to their students. When asked to select a setting for literacy instruction from 1= *not likely* to 6 = *very likely*, teachers consistently rated the special education classroom as the most likely setting, meaning this item had the least variability across survey respondents (Ruppar et al., 2011; Table 6., $M = 5.83$, $SD = 0.541$). General education classrooms were rated least likely by respondents in the same sample. These findings may align with Roberts, Hudson, and colleagues' (2024) assertion that special educators' isolation from general education colleagues and curriculum yields more limited literacy experiences for their learners

with ESN. In their theoretical framework for literacy decision making, Ruppar and others (2015) posited that this relationship is bidirectional, with educational settings connecting to special educators' beliefs about their own self-efficacy. Educators who viewed themselves with limited efficacy held lower expectations for their students, and in turn, these presumptions of incompetence become self-fulfilling prophecies (Keefe & Copeland, 2011) and reify their belief that segregated environments are more beneficial to students (Ruppar, 2017).

Connecting Beliefs and Instructional Practices

Three of the theoretical frameworks I referenced earlier in this review have examined the interaction between teachers and students (Clark & Peterson, 1986), teacher beliefs and practices (Fang, 1996), and the influence of contextual features in teacher decision making (Ruppar et al., 2015) in depth. Here, I present a preliminary model, drawing on the thought and action model (Clark & Peterson, 1986) to represent the connection between teacher beliefs and instructional practices in literacy instruction for learners with IDD. Figure 1 presents a visual representation of the sequential chain linking teacher cognition and instructional behaviors. Feedback from observed student behaviors, or student learning, either reinforces or reshapes existing patterns of cognition. The proposed model frames our understanding of teacher cognition and instructional behavior and posits the effects of feedback from observed student behaviors.

Figure 2.1
A Proposed Model of Teacher Cognition and Instructional Behaviors



This model focuses on teachers' cognition to isolate the effects of teacher beliefs on literacy instruction and student learning. This model also differentiates educators' beliefs to allow for comparison between teachers with varied expectations for student learning and conceptualizations of literacy. While not specifically included here, I acknowledge that there are many complex factors within classroom contexts including student relationships, class size, geography, school resources, or the greater sociopolitical aspects of education (i.e., racism, ableism, and other forms of structural oppression). These aspects will be discussed in depth later in this chapter. The preliminary proposed model connects beliefs, expectations, and teacher behaviors to better understand the quality of literacy instruction provided to students with IDD and how it varies based on teacher cognition. Because of the dynamic nature of classrooms and

students, contextual factors can cause educators to adjust practices, reshape beliefs, and influence instructional decision making. In the following sections, I will discuss the process by which contextual features of the classroom simultaneously shape the development of students and must also be explored as a separate source of variation in individual literacy achievement. First, I will outline the differences across educational placements that define the environmental contexts of student learning outside of teacher pedagogy.

Literacy Environments: Placement, Access, & Inclusion

As reviewed in the first chapter, many students with IDD continue to be excluded from accessing the general education settings (Agran et al., 2020; Morningstar et al., 2017), and as a result experience limited opportunities to engage with grade level literacy curriculum (Hunt et al., 2022; Roberts, Wilhelm, et al., 2024; Ruppar et al., 2018). Recent figures demonstrate that, for students with ESN, little progress has been made towards accessing general education environments. Table 2.1 shows the percent of students ages 5 - 21 participating in general education settings for 80% of the day or more based on data from 2012 and 2020 (EDFacts Data Warehouse (EDW), 2021).

Table 2.1

Changes in Participation in the LRE by Eligbility Category for K-12 Students

Eligbility Category	**2012**	**2020**	**Percent Increase**
Autism	39.5%	40.8%	1.3%
Intellectual Disability	17.1%	17.9%	0.8%
Multiple Disabilities	13.1%	15.0%	1.9%
Emotional Disturbance	44.1%	52.7%	8.6%
All Students with Disabilities	61.5%	66.2%	4.7%

Note. Data gathered from the EdFacts Data Warehouse 2019-2020 reporting on the percent of students in Placement A. The term "students with ESN" is not exhaustive and often includes eligibility labels of Autism, ID, and MD (Jackson et al., 2008) in addition to others. Students labeled as having an Emotional Disturbance are included as a reference group for the highest rate of growth within a specific eligibility.

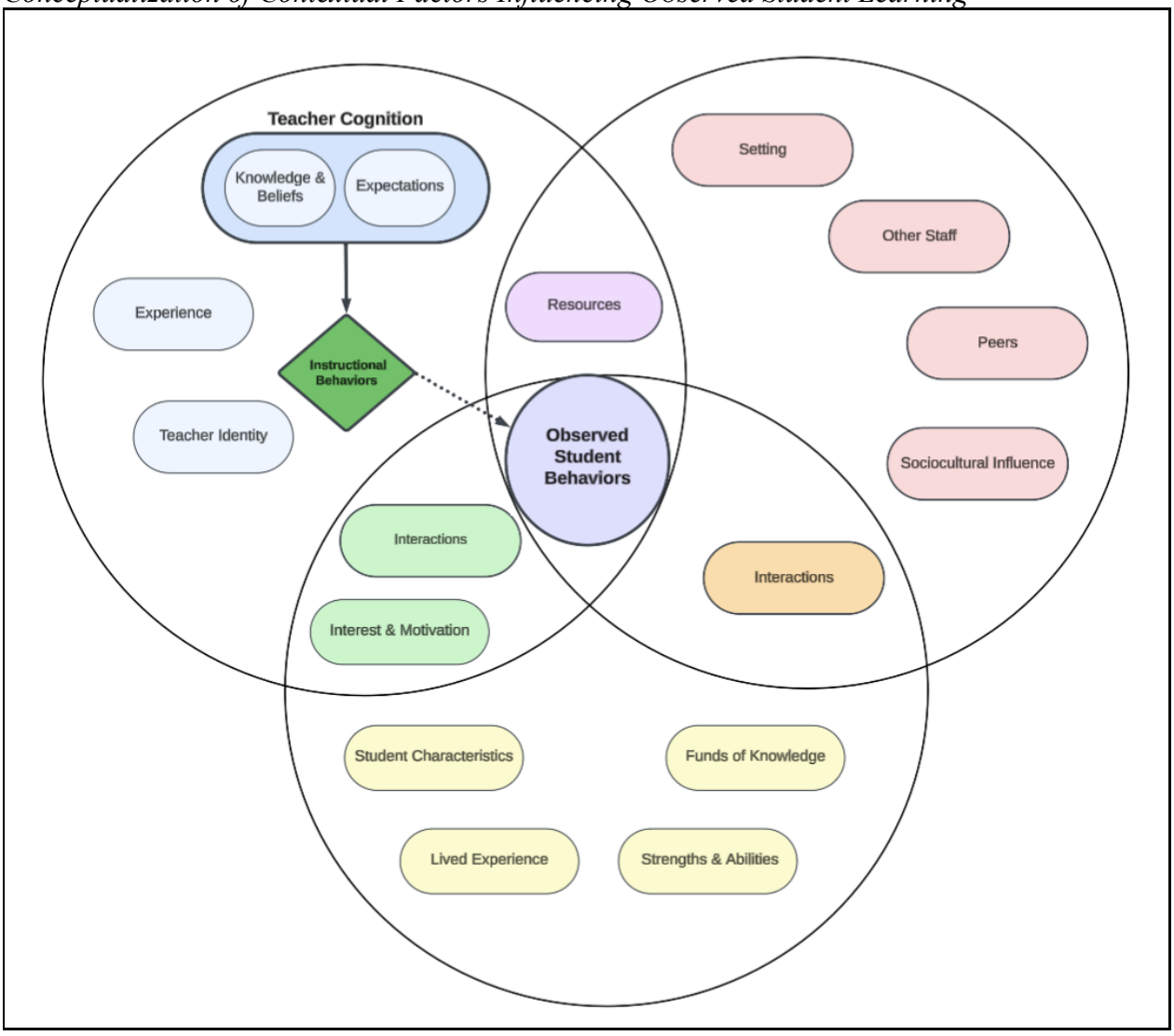
Student groups typically receiving a higher level of support showed lower rates of change across comparison years. Furthermore, 47.55 % of students with intellectual disabilities (ID) and 33.15% of students with autism (ASD) spent less than 40% of their day in general education environments based on 2020 data (EDW, 2021). Access to education in general education settings has been demonstrated to increase social relationships, academic achievement, and communication outcomes for students with ESN (for review see Mansouri et al., 2022). Yet, despite federal mandates for placing students in the least restrictive environment (LRE), the evidence implies that a large portion of students with ESN continue to be placed in segregated classrooms with little access to inclusive instruction. Thus, there is a need to investigate how educational contexts, access to the general education curriculum, and inclusive educational practices influence literacy development.

Classroom Contexts

Bronfenbrenner's (1977) ecological model for development states that human development occurs over a prolonged period of interactions between an individual and different levels of their environment (i.e., micro-, meso-, exo-, and chronosystems). In later works, Bronfenbrenner (1994) cites the ecological model as a paradigm for investigating classroom contexts and evaluating the real-life implications of educational environments and practices on learners. Figure 2 expands upon Figure 1 to illustrate how classroom contexts and instructional behaviors operate in interconnected ways. As discussed in Figure 1, teachers' instructional behaviors are presumed to influence student learning behaviors, which either reinforce or reshape teacher cognition. This is *pedagogy.* Figure 2 demonstrates the complementary influence of *context* on student behaviors.

Figure 2.2.

Conceptualization of Contextual Factors Influencing Observed Student Learning



Many researchers have considered the influence of educational placements for students with IDD and defined context in a variety of ways (Agran et al., 2020; Jackson et al., 2008; Jackson et al., 2022; Morningstar et al., 2017; Zagona et al, 2022). Some researchers have operationalized classroom contexts as all features exclusive of teachers and teaching practices (Palardy, 2015), and others have described physical setting, staff, resources, materials, and activities as elements of classroom context (Jackson et al., 2008; Ruppar, 2015). Jackson and colleagues (2008) highlighted the roles and contributions of other students as key facts of the patterns of

interpersonal interactions that characterize a setting, and argued that these direct, repeated experiences are essential for yielding context-specific growth. In the ecological model, these interactions are labeled part of the "proximal process" (Bronfenbrenner, 1994, p. 38) which describes one to one interaction with peers or adults in the immediate environment. Repeated interactions create patterns of relationships, activities, and engagement that contribute to development. This paradigm for development is also referenced as the "process-person-context model" (p. 38, Bronfenbrenner, 1994), whereby a child's learning is influenced by their environment and interactions with those within the shared context. School and classroom contexts are key factors for differentiating levels of student growth and contributing to inequalities in student achievement (Dumont & Ready, 2020; Palardy, 2015). Different educational contexts, including segregated, inclusive, or general curriculum placements, offer varying levels of support, instruction, and peer interactions for students with ESN. Ultimately, these classroom contexts affect student learning outcomes.

Contextual Features by Placement Type

IDEA defines placement categories by the percent of the day a given student is educated in the LRE, specifically the general education classroom with peers of the same age. In the relevant literature, placement types are referred to on a spectrum using the following labels: (a) "Placement A" includes students who are educated in the general education classroom for greater than 80% of the school day, (b) "Placement B" includes students spending 40-79% of the day in general education classrooms, (c) "Placement C" includes students spending less than 40% of the day in general education classrooms, and (d) "Placement D" refers to students attending special education schools with no access to general education environments (EDW, 2021; Kurth & Jackson, 2022; Jackson et al., 2022; Morningstar et al., 2017; Zagona et al., 2022). Scholars in

the field have documented differences in the content, instructional delivery, and levels of support available in each placement type in an effort to define the differences in contextual variables (Jackson et al., 2022; Zagona et al., 2022).

Contextual variables across placements have been explored using a variety of methodologies, including survey designs (Jackson et al., 2022), time sampling (Zagona et al., 2022), and matched-sample comparisons (Gee et al., 2020). All of which presented similar findings regarding the differences in educational placements. Inclusive settings (Placement A) were the most likely to offer academic engagement with grade-level curriculum (Jackson et al., 2022), access to typical peers (Gee et al., 2020), and dyadic or group instruction (Jackson et al., 2022; Zagona et al., 2022). Comparatively, partially inclusive settings (Placements B & C) offered below grade level academic materials, higher rates of staff directed, one-to-one instruction, and increasing levels of paraprofessional support (Jackson et al., 2022; Zagona et al., 2022). The majority of students in Placement B spent 1- 3 hours per day (50%), and the majority of students in Placement C (75.9%) spent less than 1 hour per day in academic coursework with grade level peers. None of the Placement C educators surveyed by Jackson and colleagues (2022) reported that they offer instructional materials at grade level or adapted from the general education curriculum. Separate school environments, Placement D, were characterized by low rates of academic responding, high rates of non-academic time, and narrow skills-based instruction (Jackson et al., 2022; Zagona et al., 2022). Teachers in these settings were often observed engaging in non-instructional behaviors or communicating with other adults in the environment (Zagona et al., 2022). From Placement A to D, each placement category is characterized by decreasing rates of access to group instruction, grade level content, and

academic responding. This suggests that placement type acts as an important contextual variable in academic outcomes for students with ESN (Gee et al., 2020).

Literacy Instruction Across Placements

Extending this analysis of contextual features, scholars have identified that the content and quality of literacy instruction is likely to vary by placement type (Ruppar et al., 2018) and individual teacher ability (Lindstrom & Lemons, 2021). Proponents of inclusive education cite the influence of context as a key argument for educating students with ESN in general curriculum environments (Kurth et al., 2014; Kurth & Jackson, 2022; Jackson et al., 2008). More recently, scholars have specifically cited the importance of examining inclusive literacy instruction for students with ESN (Hunt, 2019; Toews & Kurth, 2019). Therefore, it is necessary to delve further into distinctions of each placement type and define the contextual features of literacy instruction across settings before examining their influence on literacy development.

Features of Segregated Literacy Instruction

To date, there are relatively few studies documenting literacy instruction in special education environments, especially in early elementary settings (Lindstrom & Lemons, 2021). Ruppar and colleagues (2018) conducted an observational study documenting the literacy experience of high-school age students with ESN in general education and self-contained settings. Their findings noted students in special education settings typically received one-to-one reading instruction, with a focus on adaptive skills. In a similar secondary setting, Krishnan (2021) reported that interactions were characterized as requiring high levels of prompting, educator frustration, and low levels of student engagement. In segregated settings, students frequently interacted with single texts (Ruppar et al., 2018) or commercially available curricula (Krishnan, 2021). Scholars who have observed elementary settings noted similar trends of one-

to-one instruction, materials that prioritized functional literacy, and non-academic activities occurring during blocks for literacy instruction (Lindstrom & Lemons, 2021; Roberts, Hudson, et al., 2024). Lindstrom and Lemons' (2021) analysis of content during literacy instruction indicated that phonics and word study accounted for almost half (47.1%) of the observed reading instruction, with comprehension and vocabulary following. None of the aforementioned studies analyzed content for grade level alignment. There is robust documentation of the use of literacy interventions and evidence-based practices in self-contained settings for students with ESN (see Afacan & Wilkerson, 2018; Browder et al., 2006; Knight et al., 2019; Toews et al., 2021 for reviews). However, based on available studies, our understanding of specially designed literacy instruction provided to students in naturalistic contexts is limited (Hunt et al., 2022).

Features of Inclusive Literacy Instruction

A similarly small number of studies have documented the features of inclusive literacy instruction. While conducting a large scale, randomized control trial of an early literacy intervention, Hunt and colleagues (2022) analyzed the content of inclusive literacy instruction provided by special educators acting in the "business-as-usual" condition. Their findings reported a wide variation in literacy instruction for students with ESN with some educators addressing grade level standards and others focusing on IEP skills. Overall educators seemed to focus on vocabulary and comprehension in small group inclusive literacy instruction. Hunt (2022) cites that there is still a need for comprehensive early literacy instruction, as is provided in the general curriculum, rather than small group specially designed instruction. Other literature has shown that inclusive settings offer more exposure to a variety of literacy materials and a higher likelihood of being exposed to grade level academic content for students with ESN (Ruppar et al., 2018). Students who participated in inclusive instruction showed high rates of

engagement and participation in learning activities, even with limited access to modifications (Ruppar et al., 2018; Zagona et al, 2021). In one study (Zagona et al., 2021), students with ESN were observed fully participating in the majority of tier one instructional activities, and only 5 of 30 observations included students completing an alternate activity. This suggests that general education classrooms can include learners with ESN in grade level instructional activities with adequate support. While Zagona and colleagues (2021) provided a thorough examination of educator strategies for inclusive literacy instruction, our knowledge of other features of the contextual environment, such as materials and activities, is limited. Further research is needed to understand the contextual features of inclusive literacy instruction and its potential for supporting academic growth for learners with ESN.

Extending Our Knowledge in the Field

As documented earlier in this chapter, teacher beliefs are central to instructional decision-making (Clark & Peterson, 1986; Fang, 1996; Ruppar et al., 2015). In turn, instructional decisions about curriculum, activities, and roles of students determine the features of educational context (Jackson et al., 2008). Therefore, with respect to Bronfenbrenner's (1994) process-person-context model, different educational contexts will yield varied effects on development because the patterns of repeated interactions and relationships will differ systematically. This argues the question, what are the observed effects of inclusive versus segregated placements contexts on literacy learning for students with IDD? Jackson and colleagues (2008) address this argument calling for researchers to "provide evidence that context and curriculum choices matter, and that achieving desirable educational outcomes in children is more probable when using general education settings and curriculum" (p. 184). Our current research has a wealth of resources for intervention and instruction; however, "instructional practices do not occur in a

vacuum" (p. 176, Jackson et al., 2008), and there is a need to understand the role of contextual variables across educational placements for students with ESN.

Prior Research

There are very few studies evaluating longitudinal literacy development for young learners with ESN. In my proposed study, I plan to employ quantitative methods of data analysis to report on teachers' self-reported beliefs and practices in literacy instruction, and in a separate quantitative analysis, investigate the effects of inclusive placements on literacy learning. This section will review a small sample of relevant literature (a) describing teacher beliefs about literacy for elementary aged students, (b) evaluating literacy growth over time and (c) documenting the effects of placement on student achievement.

Current Research on Teacher Beliefs and Literacy Instruction

In a recent work, Roberts, Wilhelm, and colleagues (2024) interviewed fourteen teachers about their beliefs about the goal of literacy instruction and to describe the role of literacy in the current and future lives of their elementary aged students with IDD. Most of the teachers in this sample favored a functional approach to reading instruction as a way to prepare learners for future independence. In further connected analyses, Roberts, Hudson, and colleagues (2024) determined that teachers' conceptualizations of literacy aligned to the materials and instruction they provided to learners in their classrooms. Teachers' holding expansive beliefs about the purpose of literacy or presuming competence in their students' literacy abilities were likely to provide more engaging learning activities, such as using authentic texts or digital materials (Kleekamp, 2021; Krishnan, 2021; Roberts, Hudson, et al., 2024; Roberts, Wilhelm, et al., 2024). This research replicates earlier findings discussed in this chapter that teacher beliefs are

inextricably linked to teacher cognition and instructional decision-making in literacy (Ruppar et al., 2011; Ruppar et al., 2015; Ruppar, 2017).

In each of these works, teachers' beliefs, constructed from their knowledge of content, students, and instruction, formed expectations for how their students should engage in literacy learning. These expectations were often aligned to their understandings of the purpose and perceived value of literacy. This guided their instruction to favor either functional, traditional, or expansive approaches, based on what they assumed would be most likely to benefit their students in the future (Roberts et al., 2024; Ruppar et al., 2011). Qualitative research in this area offers a deep understanding of teachers' beliefs and their connection to instructional practices; however, it is difficult to establish a connection to student learning outcomes using this methodological approach. Additional research is needed to extend our knowledge of how teachers' beliefs shape context by describing the unique qualities of instruction across placements and observing the quantitative effects of contexts on individual student learning.

Growth Modeling in Students with ESN

One unique challenge to quantitative research in this population is the relatively small number of students with ESN (EDW, 2021). However, a small number of studies have recruited a sample size that facilitates the use of hierarchical linear models to measure literacy development across longitudinal intervention (Allor et al., 2014; Allor et al., 2010; Hudson et al., 2017; Hunt et al., 2020). Hunt and colleagues (2020) replicated a randomized controlled trial testing the efficacy of a commercially available curriculum, *Early Literacy Skills Builder,* in inclusive small group settings. Eighty elementary aged students with intellectual disability (ID) were randomly assigned into matched pairs. For one academic year, students received 30 - 40 minutes of instruction daily from a special educator in the general education setting. Literacy

skills were assessed at five timepoints across the intervention. Multilevel modeling was used in analysis due to the nested nature of the collected data which included multiple timepoints (level 1) per student (level 2) within schools (level 3). This analysis also evaluated interaction effects between student groups and student characteristics (e.g., disability label, verbal ability, and grade level). Results indicated a significant effect for the intervention group across time, and interaction effects for grade and verbal ability (Hunt et al., 2020). Allor and colleagues (2010) employed multilevel modeling for a similar intervention study investigating the effects of a comprehensive reading intervention for a small group of primary students with ID. Students were randomly assigned to participate in 40-50 minutes of direct instruction with a special educator over the course of an academic year. Allor's team (2010) modeled growth using progress monitoring measures for phonemic awareness. Even with a small sample ($N = 28$), they conducted an analysis using a two-level model of repeated measures (level 1) per student (level 2). Results indicated a higher rate of growth for phoneme segmentation and a significant interaction effect on nonsense word reading for students receiving intervention (Allor et al., 2010). These studies offer examples for adapting the use of quantitative methodologies to model longitudinal growth in students with ESN while using repeated measures designs or multiple imputation methods to accommodate for low power typically associated with small sample sizes (Allor et al., 2010; Hunt et al., 2020).

Context Effects on Literacy Learning

Prior research on the effects of educational placement has been investigated using comparative group designs (Buckely, 2006; Cole et al., 2004; Gee et al., 2020) and model as a variable of interest in quasi-experimental designs (Dessemontet et al., 2012). Using a comparison of group means design, Buckley and colleagues (2006) used a parent survey to examine the

influence of mainstream, or fully inclusive placements, on adolescents with Down syndrome. The parents of forty-six children completed rating scales on adaptive, communication, and social skills using the Vineland Adaptive Behavior Scales. Average standard scores for both inclusion and segregated school placement groups were reported in three-year age bands from 11-20 years. The authors reported that expressive language and reading and writing skills were much higher for adolescents aged 17 - 20 who had access to inclusive placements. The authors write that these results suggest that inclusive environments maximize student learning (Buckley et al., 2006). Despite being widely cited in the field, this study has several methodological issues, including: (a) measuring school environments via parent report, (b) limited information about group characteristics, and (c) no quantitative analysis of group differences. While the authors posed important research questions, significant methodological concerns limit the generalizability and validity of their findings.

Other international scholars have researched the effects of educational placements using quasi-experimental designs to compare academic achievement across contexts (Dessemontet et al., 2012). In a study of Swiss primary aged students with ID, Dessemontet and others (2012) identified 68 students for a matched sample comparison. Students were assessed three times across two academic years. Adaptive skills were measured using a parent rating scale and academic achievement was measured using standardized school assessments in numeracy and literacy. Group level analyses were conducted using a repeated measures analysis of variance (ANOVA). Findings indicated a significant difference in literacy skill development across groups and offered empirical support for the use of inclusive instructional practices. Dessemontet and Chambrier (2015) later extended this work by evaluating the influence of educational placement type on the development of phonological awareness for young Swiss students with ID

(*n* = 129 children). Their findings suggested that inclusive placements are significantly correlated with improved word reading skills and reading comprehension across the academic year. Hierarchical regression analyses confirmed that placement was a significant predictor of word reading and reading comprehension ability after one year of instruction (Dessemontet & Chambrier, 2015). The results of Dessemontet and colleagues (2012; 2015) work offer evidence to support inclusive practices in Switzerland, and comparable analyses in US settings might offer insight into the effects of our own educational placement systems. Quasi-experimental designs drawing data from existing placement structures offer an opportunity to critically assess the relationship between classroom contexts and literacy achievement outside of interventional research.

Purpose of this Study

In 2019, Toews and Kurth issued a call to action for building our knowledge on inclusive literacy instruction and moving beyond functional literacy for learners with ESN. A small number of studies have investigated the use of specific pedagogical approaches in inclusive classrooms, such as UDL (Coyne et al., 2012) or documented the use of specially designed instruction (Hunt et al., 2022) with learners with ESN. While we have strong evidence of the effectiveness of literacy interventions, there have been very few works documenting the outcomes associated with naturally occurring instruction. Intervention research has created opportunities for literacy learning by resisting readiness models and demonstrating that students with ESN can benefit from systematic instruction. However, narrowing our scope of literacy instruction to specific practices in isolation, or solely in comparison to ineffective instruction, limits the generalizability of findings across environments. Jackson and colleagues (2008) describe this *relative value* as a major limitation, in that progress is only connected to the

practices and population examined within a given study. This historical focus on specially designed curriculum and interventions perpetuates the idea that literacy instruction can only occur in segregated settings for students with ESN (Hunt, 2019). Intervention research inadvertently emphasizes the "quality of instruction" as a key variable while minimizing the role of context and placement on student outcomes (Agran et al.2020; Jackson et al., 2008). This work has been vital to propagating research-based practices and encouraging higher expectations for literacy learning; however, our understanding of the relationship between inclusion and long-term academic outcomes is underdeveloped. This inquiry seeks to understand teacher beliefs and practices as they influence instruction within specific settings but positions educational context as a variable of interest for observing student growth in naturalistic settings.

Research Questions

1. How do the beliefs of teachers of IDD students in grades 1-5 differ across placement types, and what are the characteristics of their literacy content and instructional practices?
2. What are the mean patterns of initial status and linear growth rates in literacy and language outcomes for elementary students with IDD in grades 1-5, across one academic year?
3. Do grade and educational placement type (inclusive vs. non-inclusive classrooms) predict literacy or language trajectory parameters (initial status and change over time) for these students, and/or do these effects interact?

CHAPTER THREE: Methods

This chapter provides an overview of the design and methods for this inquiry. This chapter begins with a brief introduction to my design. The following sections review key study components and methodology, and the final section reviews the analysis plan. This inquiry examined data collected from a larger exploration project, the University of Washington Reading Development Project (RDP). The RDP was a convergent parallel mixed method design exploring how emergent literacy, reading, and language skills develop in learners with ESN over the early elementary years. Qualitative data explored literacy context through semi-structured interviews with families, teachers, and classroom observations. Quantitative data was gathered using a repeated measures design monitoring the growth of early literacy skills across two academic years. Data integration occurred across multiple iterative cycles and continued analysis is ongoing.

Research Design

In this inquiry, I employed a correlational design to analyze data collected via survey and repeated assessments as part of a larger grant-funded exploration project aimed at describing literacy outcomes for children with IDD. For this study, I used descriptive analyses to evaluate teacher beliefs and practices as well as multilevel linear regression modeling to predict growth patterns in six key literacy and language variables, including: word reading, decoding, reading comprehension, receptive vocabulary, expressive language, and listening comprehension. These measures were selected to capture development across code-focused and meaning-focused early literacy skills (Gough & Tumner, 1985; Scarborough, 2001) in a single academic year.

Participants

In the original study, conducted from 2019-2023, students in grades 1- 5 with intellectual or developmental disabilities were recruited as participants for the RDP. All students were recruited from the Puget Sound area of western Washington through cooperating school districts, community organizations, and social media recruitment. Prior to enrollment in the larger study, all students were screened to ensure they met inclusionary criteria of scoring below 80 on standard scores for cognitive and adaptive functioning, as measured respectively by the *Kaufman Brief Intelligence Test* (Kaufman & Kaufman, 2004) and *Vineland Adaptive Behavior Scales - 3rd Edition* (Sparrow et al., 2005). After students met inclusionary criteria, families and teachers were invited to participate in additional opportunities within the longitudinal mixed-methods design, including parent interviews, teacher interviews, classroom observations, and surveys. From this larger set of participants, a subset of student and teacher participants was created to connect student achievement scores, instructional surveys, and educational placement data. All study activities were approved and monitored by the UW Institutional Review Board and Human Subjects Division.

Teacher Participants

In the original study, thirty-four cooperating teachers were contacted via email with a link to participate in the RDP Literacy Instruction Survey. Teachers were contacted during winter and spring testing windows for the 2023-2024 academic school year. Teachers invited to participate in the study had at least one student participating in the RDP, and the average number of students was 1.50 students per teacher (range: 1 - 4 students). Survey response rates were 50% (n = 17) for the winter administration and 47% (n = 16) for the spring administration. For the spring survey, additional items were added asking teachers to self-identify their classroom LRE

placement and report on their beliefs about the importance of literacy instruction. Participants were asked to electronically give consent in the first item of the online survey. In the spring, 1 teacher declined to participate, leaving a sample size of 15 teachers. Sample demographics from participating teachers are reported in Table 3.1.

Student Participants

From the larger study sample of 51 students for which data was collected, a subset of 32 students who had completed three time points of data collection during the 2023-2024 academic year were selected for analysis. All students within this sample met criteria for the RDP and were enrolled in grades 1-5 during the time of data collection. The selected sample of students represents the culturally and linguistically diverse sample of students enrolled in public schools in western Washington. Demographic information for this sample is presented in Table 3.2.

Table 3.1

Sample Demographics for Teacher Participants

Characteristic	Survey Respondents			
	SPED n = 15		GED n = 4	
	n=	*%*	*n=*	*%*
Years Experience				
< 5	*5*	33%	*1*	25%
5 to 15	*7*	47%	*1*	25%
> 15	*3*	20%	*2*	50%
Gender				
Female	*12*	80%	*3*	75%
Male	*2*	13%	*0*	
Non-Binary	*1*	7%	*1*	25%
White	*12*	80%	*2*	50%
BIPOC				
Asian	*3*	20%	*2*	50%
Black	*0*		*0*	
Hispanic/ Latinx	*2*	13%	*0*	
Native American	*0*		*0*	
Multiracial	*2*	13%	*0*	
Grades Taught				
First	*4*	27%		
Second	*4*	27%	*1*	25%
Third	*5*	33%	*1*	25%
Fourth	*6*	40%	*3*	75%
Fifth	*2*	13%	*0*	
More than 1 Grade Level	*12*	80%	*1*	25%

Note. BIPOC = Black, Indigenous, and People of Color. GED = General Educator. SPED = Special Educator. This table reports self-reported demogrpahic characteristics included in instructional survey responses. 2 educators reported more than one race category, and were counted as multiracial, which accounts for a value > 15 in total race values. 1 survey respondent did not consent to participate and was ommitted.

Table 3.2

Sample Demographics for Student Participants

	Student Participants N = 32	
	n	*%*
Gender		
Female	*11*	*34%*
Male	21	*66%*
Non-Binary	0	*0%*
Multilingual	6	*19%*
Use AAC	7	*22%*
White	13	*41%*
BIPOC		
Asian	5	*16%*
Black	4	*13%*
Hispanic	1	*3%*
Native American	0	*0%*
Multiracial	2	*6%*
Grade		
1	8	*25%*
2	4	*13%*
3	4	*13%*
4	8	*25%*
5	8	*25%*
Start Age	M= 8.57 years	*(SD = 1.61)*
Cognitive Score	M= 52.62 SS	*(SD = 11.44)*
Adaptive Score	M= 66.31 SS	*(SD = 7.44)*

Note. Characteristic reports are based on parent reports on home literacy surveys completed by n= 21. No data racial or linguistic information is available for n = 11. Mean start age in years calculated aa the average of first Test A & Test B values. AAC = Augmentative and Alternative Communication. BIPOC = Black, Indigenous, and People of Color.

Setting

Overview

The sample of students were from thirteen elementary schools and two K-8 schools across seven school districts. One participating school was a private, urban academy serving students in grades K-8 with diagnoses on the autism spectrum. All public schools included in this

sample provided general and special education services, and six were designated as Title 1 institutions. The average enrollment across schools was 420 students (range 317 – 650 students). Schools in this sample represented a diverse community with an average of 58.6% of learners identified as students of color (range 31.5 – 92.2%), 21.1% multilingual learners (range 4.5 - 57.7%), 37.2% economically disadvantaged learners (range 6.1 – 78.9%), and 18.8% students with disabilities (range 10.2 – 25.5%).

Participant Placements

Students participating in this study were served across a variety of educational placements, ranging from segregated, special education schools to fully participating in general education throughout the day. Learners in this sample had varied levels of access to the general education curriculum. Due to district research guidelines, researchers were not able to request confidential IEP records from schools to directly obtain the LRE statements of participating students. As such, for RQ3 placement categories were determined with respect to IDEA (2004) guidelines that monitor access to the LRE for students with disabilities (see descriptions of Placements A-D; Kurth & Toews, 2022). Placement determinations were obtained using a tiered process for requesting placement category information and confirmed through triangulation across data sources. Placement information was compiled from various sources including teacher instructional surveys, parent and teacher emails, and qualitative interview transcripts. The process for obtaining placement categories for students in this sample is described in the following sections.

Determining Inclusive Educational Placements

Teacher Instructional Survey

The first level of placement information was obtained from teachers participating in the spring instructional survey. Teachers were asked to identify the extent to which most of their students had opportunities to participate in the general education environment with same age, nondisabled peers (see Appendix A). Placement information was obtained for 21 participants through the instructional survey.

Teacher Email

For students identified for this sample who did not have a teacher complete the instructional survey, follow-up emails were first sent to assigned special educators (n = 5) asking them to confirm placement descriptions for their students as described in the instructional survey. Four educators responded and confirmed this information via direct email, which provided information for an additional seven students in the growth modeling sample. One special educator did not respond via survey or direct email.

Parent Email

Three students in this sample were independently enrolled by their parents, outside of school contexts. Those parents were asked to confirm the percent of day their children spent in the general education environment based on the reported values in the child's LRE statements listed in their IEP documentation. All three parent contacts confirmed the extent to which their child participated in general education curriculum during the day. For students enrolled through school settings, additional information was solicited via parent email if their teacher did not provide a response or a discrepancy between placement categories was observed for participants. For example, if a research assistant reports that a student accesses the general education

environment and their teacher indicated that child only participates in special education, or a parent interview documented the provision of inclusive services but no teacher response was available, parents were contacted to confirm the percent of the school day spent in the LRE based on the ranges outlined in IDEA (2004). Triangulation across data sources (i.e., parent interviews, teacher surveys, researcher observations, and classroom observations) was used to confirm placement labels for this sample for four students.

Sample of Students by Placement Category

After completing placement triangulation, I coded placement status for the 31 students for whom information was available (one student's information is included in the analyses for RQ1 only). Placement category groups within this sample were determined by the naturally occurring educational placements, as agreed upon by the participants' school IEP team, and remain outside of experimenter control. Placement information was not able to be obtained for one student, and that participant was removed from growth modeling analysis. For the 31 students used in multilevel modeling analysis, the distribution of students by grade and placement is displayed in Table 3.3.

Table 3.3

Distribution of Student Placements as Defined by IDEA

	A	B	C	D
	80% or more in GE	*40-79% in GE*	*40% of less in GE*	*Separate School*
Grade 1	2	3	2	1
Grade 2	0	1	3	0
Grade 3	1	1	2	0
Grade 4	5	1	1	1
Grade 5	0	2	6	0
Total Sample	8	7	14	2

Note. n = 31 students, one grade 3 student was omitted because placement information could not be confirmed. GE = General Education settings with same-age peers. Placement categories are derived from reporting standards outlined in Section 618 of IDEA.

Measurement Timepoints

As stated earlier in this chapter, this inquiry analyzes data combined from teacher surveys and a repeated measures assessment of student growth using standardized literacy achievement measures. Teacher self-report was used to examine characteristics of classroom placements and capture teacher beliefs about literacy instruction. Student performance on commercially available achievement tests measured outcome variables of interest. In tandem, these measures provided insight into the descriptive features of instruction provided across placements and allowed us to further examine the influence of classroom placement on student learning. Figure 1 presents a visual timeline of data collection for student assessments and teacher surveys in this sample.

Figure 1.

Timeline of Data Collection Across Student & Teacher Measures for 2023-2024

Measures	Fall				Winter				Spring	
	Sept	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*
Student Assessments		T1				T2			T3	
Teacher Surveys						Survey 1				Survey 2

Teacher Surveys

Teachers participated in a brief, instructional survey that was administered remotely using Qualtrics, an online platform for survey research. The 12-question survey collected teacher demographic and classroom data, and asked teachers to recall and report on their instruction in the last week. The survey included three scales: literacy content, instructional practices, and beliefs about literacy instruction. For content (10 items) and instructional practices (8 items), teachers were asked to indicate on a 5-point scale how frequently (1= never to 5 = daily) they addressed specific literacy content areas, used instructional groupings, and incorporated instructional supports (e.g., assistive technology, instructional technology, or peer supported learning). For beliefs about literacy instruction, teachers were asked to select three of nine statements that best describe the goal of literacy instruction in their opinion (see Appendix A for a list of items). The survey itself was developed using exploratory mixed methods (Creswell & Plano-Clark, 2018), in which themes from qualitative interviews were used to develop survey items. Several rounds of revisions occurred, and the survey was reviewed by subject matter experts in literacy, instruction for students with ESN, and quantitative methodology before distribution to participants. The complete text of the survey is included in Appendix A.

Reliability and Internal Consistency. Cronbach's alpha (Cronbach, 1951) was calculated as a measure of reliability for rating scale items addressing literacy content and instructional practices. The literacy content scales contained 10 items and showed a reliability of .70 across respondents. The instructional practices scale contained 8 items and showed weak

consistency in this sample, .23. Further analysis of items suggested that this may have been due to several factors including: social desirability bias (DeVellis, 2017; Kurmpal; 2011), a small number of items, inversely correlated items, and multiple dimensions addressed within items on the scale (i.e., groupings and strategies). As such, test-retest reliability was completed with a subsample of teachers (n = 13) who responded to both winter 2024 and spring 2024 administrations of the survey. Test-retest reliability was calculated using an intra-class correlation coefficient (ICC; Koo & Li, 2016). No significant differences were identified between group averages for winter and spring administrations, and the ICC was calculated as .56, indicating moderate reliability for the instructional practices scale. Survey results are reported and interpreted with caution due to the limited generalizability of the sample and weak reliability of scales.

Student Assessments

As participants in the RDP, students were assessed five times over two academic years, 2022-2024. Students were assessed about every 4 months in two one-hour sessions. During assessments, participants completed two reading assessment batteries, Test A and Test B, measuring a variety of early literacy and language skills. The order of assessment batteries was randomly assigned and counterbalanced across participants to control for potential order effects. This study analyzed raw score data from three of the five original time points, over the 2023-2024 academic year in the fall, winter, and spring, respectively, isolated to avoid introducing confounding variables such as summer break or new classroom assignments.

Procedures. Tests were administered in one-on-one settings by research team members. During test sessions, research procedures included accommodations and supports to increase student engagement and motivation (Wilhelm et al., in preparation). This included the use of

allowed accommodations (e.g., human speaker, flexible seating, testing breaks) and behavioral supports for sustaining engagement (e.g., token boards, visual schedules, and first-then boards). The only test modifications were the use of a human speaker rather than audio-recording for measures of phonological awareness. However, those measures are not included in this data set. Most of the student assessments were completed during the regular school day in minimally disruptive locations, such as quiet areas of the classroom, tables in the hallway, school libraries, or empty classroom spaces. Two students completed all three assessments in quiet community spaces (i.e., their local library or our project office), and one participant completed one testing session at their local library before consent was received by their school. To ensure student assent, students were given the choice to decline testing sessions or revoke assent during any of the testing activities.

Procedural Fidelity. All research assistants were required to demonstrate at least 90% fidelity to assessment procedures for both assessment batteries before beginning data collection with student participants (Gersten et al., 2005; Toste et al., 2023). Research team members included one special education faculty member, who was a principal investigator on the project, and four current graduate students at the UW in educational fields. Procedural fidelity was assessed during role-playing sessions with one observer completing the 62-item fidelity checklist. Fidelity checklists included items for correctly implementing behavioral supports, administering subtests using standardized procedures, and correctly following scoring rules. Average fidelity across all team members was 94.14% for Test Battery A and 96.66% for Test Battery B.

Outcome Variables

Six norm-referenced measures were selected as dependent variables from the full assessment battery to represent key areas in early literacy and language development. Literacy measures were selected to target text-based skills including decoding and deriving meaning from independently read text. These subtests were selected as measurements of "code-focused" (Scarborough, 2001) skills that are likely to develop through systematic, structured, teacher-delivered literacy instruction (Spear-Swerling, 2022). As complementary measures, three language subtests were selected as variables of interest that capture "meaning-focused" skills, for example, vocabulary, expression, and listening comprehension (Scarborough, 2001). While these areas benefit from targeted instruction, they are also influenced through oral language activities with others in the learning environment through peer modeling and observational learning (Spear-Swerling, 2022). Collectively, these variables of interest in literacy and language provide insight into the influence of both instruction and environment on growth for learners with IDD.

Literacy Measures. Three subtests of the *Woodcock-Johnson IV Tests of Achievement* (Schrank et al., 2014) were used as dependent variables. The Letter-Word Identification subtest (LWID) was selected to measure word reading, the Word Attack subtest (WA) was selected for decoding, and the Passage Comprehension subtest (PC) was selected to measure independent reading comprehension skills. The WJ IV Tests of Achievement are a widely used "off-the-shelf" achievement measure that is both norm and criterion referenced. This test was selected because it employs both receptive and expressive responding to measure a wide spectrum of skills. Prior research has documented the use of the *Woodcock-Johnson Tests of Achievement* (Coyne et al., 2012) and various commercially available measures of word reading

in research involving students with ESN (Allor et al., 2010, Hunt et al., 2020). This increases the likelihood that students will have the opportunity to demonstrate a measurable score. For students ages 5 to 19, this subtest reports a median reliability score of alpha = .92. Shrank and colleagues (2014) report that measures from the WJ-IV are suitable for progress monitoring when administered 2-3 times per year.

Sample level reliability of standardized measures used across time points was calculated using IBM SPSS Statistics (Version 29). Item-level, binary data was used to calculate Cronbach's alpha (Cronbach, 1951) as a measure of the internal consistency of the variables of interest at each tested time point (i.e., fall, winter, spring waves of assessments). All variables of interest measured by the Woodcock-Johnson Tests of Achievement (WJIV; 4th ed.) were determined to have reliability coefficients within the "good" (> 0.80) to "excellent" range (> 0.90) across all time points. Cronbach's alpha values for the Letter Word Identification (LWID) scale (k = 78 items) were calculated as alpha = .97 for the fall (n = 29), alpha = .97 for winter (n = 31), and alpha = .97 for spring (n = 31). Word Attack (WA) (k = 32 items) had calculated values of alpha = .91 for the fall (n = 28), alpha = .89 for winter (n = 31), and alpha = .92 for spring (n = 31). The Passage Comprehension (PC) subtest (k = 52 items) was calculated as alpha = .88 for the fall (n = 28), alpha = .90 for winter (n = 32), and alpha = .90 for spring (n = 31).

Language Measures. The Receptive Vocabulary (RV), Sentence Comprehension (SCP), and Sentence Expression (SXP) subtests of the *Comprehension Assessment of Spoken Language 2nd edition* (CASL-2; Carrow-Woolfolk, 2017) were chosen as language variables for this study. RV was selected as a variable because it is viewed as a key area of traditional literacy skills (NRP, 2000) and is a frequently used metric in this population of students. SCP was selected as a

target variable for evaluating growth in listening comprehension, and SXP was selected as an outcome measure of expressive language development. The SXP measure requires expressive language; however, early items elicit imitative or one-word responses aligned to the communicative skills of some of the students in this sample which allowed them to achieve a measurable score. Items in the RV and SCP subtests use receptive responses increasing the likelihood that students will be able to demonstrate reliable, measurable scores regardless of their preferred modality of communication. The RV, SXP, and SCP subtests are intended for use with individuals between the ages of 3 - 21 years old. For children between the ages of 6-10, the RV subtest has been reported to have a reliability of .93-.94, using the Spearman-Brown split-half reliability calculations (Carrow-Woolfolk, 2017). Likewise, for children between 6-10 years old, the SXP and SCP have been shown to have reliabilities of .89-.96 and .93- .97, respectively. Test-retest reliability is also reported in the test manual as .79 for RV, .68 for SXP, and .78 for SCP. RV and SXP tests were reported to have intertest correlations of .78 for 7-9-year-olds and .73 for 10-12 year-olds in the norming sample, and SCP tests were reported to have intertest correlations of .69 for 7-9 year-olds and .66 for 10-12 year-olds (Carrow-Woolfolk, 2017). Norming samples for this instrument included individuals with IDD and other educational disabilities.

As with the literacy measures, sample level reliability was evaluated for language measures. Measurements obtained using the Comprehensive Assessment of Spoken Language (CASL; 2nd ed.) demonstrated reliability coefficients in the "good" to "excellent" range. Cronbach's alpha values for the Receptive Vocabulary (RV) scale (k = 71 items) were calculated as alpha = .95 for the fall (n = 29), alpha = .95 for winter (n = 31), and alpha = 0.95 for spring (n = 29). The Sentence Expression (SXP) scale (k = 50 items) demonstrated slightly

lower reliability with values of alpha = .89 for the fall (*n* = 28), alpha = .92 for winter (*n* = 27), and alpha = .89 for spring (*n* = 28). Sentence Comprehension (SCP) had coefficients in the "excellent" range, specifically, alpha = .96 for the fall (*n* = 28), alpha = .95 for winter (*n* = 27), and alpha = .96 for spring (*n* = 28). These values signify strong internal consistency within each subtest. This suggested that the selected measures for variables of interest are adequately measuring the latent literacy and language constructs targeted in each subtest and demonstrate scale reliability with this specific sample of students.

Test-Retest Reliability. In addition to scale reliability, test-retest reliability was calculated across assessment time points using intraclass correlation coefficients (ICC) to assess the consistency of student scores across measurements.. Test-retest reliability was calculated in SPSS using a two-way mixed effects model with absolute agreement definition to reflect multiple measurements using the same scale and sample participants. For measures of the WJIV, the LWID had an ICC = .91, with a 95% confidence interval (CI) of .84 – .96, indicating strong reliability. The WA and PC subtests demonstrated reliabilities of ICC = .74, (95% CI: .57 – .86) and ICC = .82 (95% CI: .69 – .91) respectively. On CASL subscales, RV ICC = .63 (95% CI: .43 – .78), SXP ICC = .62 (95% CI: .42 – .79), and SCP ICC = .75 (95% CI: .58 – .87). Given that the moderate range of reliability is referenced as ICCs = .50 – .75 (Koo & Li, 2016), these sample-based values may be interpreted as acceptable, especially given the study's small sample size (*n* = 28). In summary, the test-retest values reported here indicate that measurements of the scales used in the current study were consistent across fall, winter, and spring assessment waves.

Analysis Plan

Overview

Analyses were completed in two stages. First, teacher responses on the instructional survey were tabulated to answer RQ1, which was aimed at reporting the observed differences in instruction between teacher reports across placements (using descriptive statistics). Analyses to answer RQ2 and RQ3 utilized multilevel linear regression modeling to estimate and predict patterns in 3-timepoint linear growth trajectories for the six literacy and language outcome variables described above, including: (a) word reading (LWID), (b) decoding (WA), (c) reading comprehension (PC), (d) listening comprehension (SCP), (e) expression (SXP), and (f) receptive vocabulary (RV). Across all analyses for RQ2, students' raw scores rather than age-adjusted standard scores were modeled because (a) children's ages also change over time and modeling standard scores can appear flat even when learning occurs, (b) age was incorporated as a predictor in the second set of models, and (c) standardized scores for learners with ESN often exhibit floor effects (DiStefano et al., 2020).

For RQ2 specifically, different random effects structures were examined and compared to determine the best fitting functional form of children's change over time. After this, for RQ3 specifically, child grade level (grades 1 – 5) and educational placement (inclusive or non-inclusive) were added to predict student's the initial levels at the start of the year (i.e., intercepts) as well as their linear rate of change over time (i.e., slopes). Analyses were conducted in *SPSS* for RQ1 and *R* for RQs 2-3.

Teacher Surveys of Literacy Instruction

Descriptive Statistics. Teacher responses were analyzed within the full sample of respondents and across groups of general and special educators to observe patterns of responding

that describe contextual differences between placements in this sample. Means, ranges, counts, and likelihood of responses were calculated for the frequency items (i.e., content area, instructional grouping, and instructional technology use).

Repertory Grid. Repertory grids are used in qualitative and quantitative research to facilitate the analysis of constructs by eliciting groups of responses from participants (Brophy & Good, 1986; Easterby-Smith, 1980). For this inquiry, teacher responses to Item 10, "*In your opinion, what is the goal of literacy instruction?",* were counted and mapped relative to functional, traditional, and expansive approaches to literacy instruction. Responses were grouped by teacher placement type. The grid was organized by groups of educators to visually assess similarities in responses across teachers in similar classroom contexts within this sample. I conceptualized that positioning frames of literacy and educator roles as opposing axes would cluster similar group responses. Analysis explored the frequency of teachers' responses by item and how those align to each construct by group membership. Additional thematic inferences were drawn from patterns in responses.

Modeling Student Outcome Growth Trajectories

With only three time points of data collection, only a linear model could be fitted to the data. To best accurately reflect the mean spacing of measurement occasions across children (which were slightly different for the two test batteries but within two weeks of each other) for the literacy outcomes measured in battery A (word reading, decoding, and reading comprehension), time was coded as T1 = 0.00, T2 = 3.50, T3 = 7.00 months. For language outcomes measured in battery B (receptive vocabulary, sentence expression, and sentence comprehension), time was coded as T1 = 0.00, T2 = 3.70, and T3 = 7.30.

Before conducting the growth models, classrooms and districts were considered as potential level-3 factors (i.e., random effects). However, there were nearly as many classrooms (n = 22 classrooms) as students (n =32), and classrooms were therefore not considered further. When district intraclass correlations (ICCs) were examined using 3-level intercept-only models, the ICCs were zero for the three literacy outcomes and close to zero for the three language variables (for receptive vocabulary the ICC was.02, for sentence comprehension it was .04, and for sentence comprehension it was .09). Given that the median district ICC was less than .03 and the total number of districts within the sample was only n = 7, district was also not considered for further modeling. In short, I evaluated the best model for the random effects by comparing a series of 2-level linear models in which measurements (L1) were treated as nested within students (L2) for each outcome variable.

Specifically, to address RQ2 (determining the best-fitting growth trajectory for this unique sample of children with IDD), a model with a random intercept and fixed slope was specified first; thereafter, I specified a model with a random intercept and random slope but disallowed the random effects to correlate. Finally, I specified a model with a random intercept and slope that were allowed to correlate. Likelihood Ratio Tests (LRTs) and the Bayesian information criterion (BIC) were used to evaluate which model fit the data best (Kass & Rafferty, 1995; Snijders & Bosker, 2012). The general multilevel linear growth model allowing for random slopes is as follows.

$$Y_{ij} = \gamma_{00} + \gamma_{10}Time(Mos) + U_{0j} + U_{1j}Time(Mos) + R_{ij} \quad (1)$$

In the model above, the *i*th measurement for the *j*th student is modeled as a function of the sum of the mean student-level initial score (in fall) at the first measurement occasion (γ_{00}), the mean rate of change per month across the academic year since fall (γ_{10}), the student-level residual

deviation between the student's observed fall score and the mean across all students (U_{0j}), and the within-student residual (R_{ij}). The student-level intercept and slope residual errors are assumed to be normally distributed with a mean of zero and variance of τ_{00} and τ_{10} (they may also be correlated when specified as such). The within-student residual is assumed to be uncorrelated with any other terms in the model and is normally distributed with a mean of zero and variance of σ^2.

To address RQ3, I used the best-fitting models from the previous analysis and added the effects of grade level. These predictors were effect-coded (grade level reference category was grade 1) to ensure that the intercept and slope estimates reflected the mean across the students. The general multilevel model for each outcome (assuming random slopes as shown in equation 1) was as follows.

$$
\begin{aligned}
Y_{ij} = {} & \gamma_{00} + \\
& \gamma_{01}Gr2_{.j} + \gamma_{02}Gr3_{.j} + \gamma_{03}Gr4_{.j} + \gamma_{04}Gr5_{.j} + \\
& \gamma_{10}Time_{ij} + \\
& \gamma_{11}Time_{ij}Gr2_{.j} + \gamma_{12}Time_{ij}Gr3_{.j} + \gamma_{13}Time_{ij}Gr4_{.j} + \gamma_{14}Time_{ij}Gr5_{.j} + \\
& U_{0j} + U_{1j}Time(Mos)_{ij} + R_{ij} \qquad (2)
\end{aligned}
$$

In equation 2, the main effect of grade level on fall scores is estimated using the grade level effects (γ_{01}-γ_{04}). The interpretation of these effects are in comparison to the mean fall score (γ_{00}). The effects of grade level on change over time are represented by the cross-level interaction terms ($\gamma_{11} - \gamma_{41}$); again, the interpretation of the effects is compared to the mean growth estimate (γ_{10}).

Finally, a third model was estimated to evaluate the effect of inclusive placement and its interaction with grade level on growth parameters. Recalling that students' classroom placements

varied from no access to general education (Placement D), less than 40% of the day in general education (Placement C), between 40-79% of the day in general education (Placement B), to more than 80% of the day in general education (Placement A), students' placement was coded +1 for those who were participating in general education for more than 40% of the day (i.e., Placements A & B), otherwise they were coded -1. The model as follows.

$$
\begin{aligned}
Y_{ij} = {} & \gamma_{00} + \\
& \gamma_{01}Gr2_{.j} + \gamma_{02}Gr3_{.j} + \gamma_{03}Gr4_{.j} + \gamma_{04}Gr5_{.j} + \gamma_{05}IP_{.j} + \\
& \gamma_{06}Gr2_{.j}IP_{.j} + \gamma_{07}Gr3_{.j}IP_{.j} + \gamma_{08}Gr4_{.j}IP_{.j} + \gamma_{09}Gr5_{.j}IP_{.j} + \\
& \gamma_{10}Time_{ij} + \\
& \gamma_{11}Time_{ij}Gr2_{.j} + \gamma_{12}Time_{ij}Gr3_{.j} + \gamma_{13}Time_{ij}Gr4_{.j} + \gamma_{14}Time_{ij}Gr5_{.j} + \\
& \gamma_{15}Time_{ij}IP_{.j} + \\
& \gamma_{16}Time_{ij}Gr2_{.j}IP_{.j} + \gamma_{17}Time_{ij}Gr3_{.j}IP_{.j} + \gamma_{18}Time_{ij}Gr4_{.j}IP_{.j} + \gamma_{19}Time_{ij}Gr5_{.j}IP_{.j} + \\
& U_{0j} + U_{1j}Time(Mos)_{ij} + R_{ij} \qquad (3)
\end{aligned}
$$

In the model above, the new terms evaluate whether inclusive placement predicted fall scores on average (γ_{05}) or growth rates on average (γ_{15}). Moreover, the model also tests whether grade level differences in the fall varied depending on inclusiveness placement ($\gamma_{06} - \gamma_{09}$) as well as whether grade level differences in growth rates vary depending on inclusiveness placement ($\gamma_{16} - \gamma_{19}$).

Models were estimated in *R* (2023) with maximum likelihood using the lme4 package (Bates et al., 2015). To obtain Satterthwaite degrees of freedom, the lmerTest package was also used (Kuznetsova et al., 2017). Approximate R^2 effect sizes were computed using r2mlm in *R* (Rights & Sterba, 2019; Shaw et al., 2020), and data visualization was carried out using the *R* ggplot2 package (Wickham, 2016).

CHAPTER 4: Results

The overarching goal of this inquiry is to evaluate teacher beliefs, instructional practices, and educational contexts for elementary aged students with IDD, and to evaluate how educational placement inclusiveness may be linked with literacy and language growth trajectories for these children. Analyses were completed using the results of the teacher instructional survey and student achievement data collected through the administration of repeated literacy and language measures over the course of one academic year. This chapter will report on the results pertaining to the three research questions (RQs), as restated below.

1. How do the beliefs of teachers of IDD students in grades 1-5 differ across placement types, and what are the characteristics of their literacy content and instructional practices?
2. What are the mean patterns of initial status and linear growth rates in literacy and language outcomes for elementary students with IDD in grades 1-5, across one academic year?

   Do grade and educational placement type (inclusive vs. non-inclusive classrooms) predict literacy or language trajectory parameters (initial status and change over time) for these students, and/or do these effects interact?

RQ1: Results from the Teacher Survey of Practices and Beliefs

Survey data describing literacy content and instructional approaches was collected from 19 teachers across winter and spring survey administrations during the 2023-2024 school year. This sample included 15 special educators, serving students in grades K-8, and four general educators serving students in grades 2 – 4. Special educators reported serving students across multiple grade levels (range 1- 6 grades, M = 3.14 grades). Three general educators reported

serving one grade level, and one teacher reported that her students were in a 3rd/4th grade split level classroom. Additional demographic information about participating teachers can be found in Table 3.1. The total duration of the survey, rounded to the nearest second, ranged from 2:04 - 30:15, with an average time of 7:43. One respondent completed the survey in 13 hours and 55 minutes, and this value was omitted from the calculated range and mean as an outlier. The recorded start and completion dates suggest the respondent left the survey window open overnight and completed the survey the following day. All participants completed the survey, including responses to all items on the content and instructional scales. All participants participating in the spring administration completed the literacy beliefs item. Due to the low number of responses from general educators (n = 4) and their respective grade level standards, descriptive statistics should be interpreted with caution.

Descriptive Statistics

For both the literacy content areas and instructional strategies scales, teacher respondents were asked to indicate how frequently they had addressed content or used specific grouping and support strategies within the last week. The scale ranged from 1 indicating "*not at all"* to 5 indicating "*daily"*. Means, standard deviations, and distributions of teachers' responses are listed in tables below.

Literacy Content

Survey responses indicated a wide variation in the frequency of addressing literacy content areas across educators. Of the ten included content areas, most special educators reported that they provided instruction in five of the focus areas daily, specifically: PA, phonics, reading texts, handwriting, and oral language or communication. A few special educators selected "*not at all*" for five focus areas of instruction, including fluency (n = 3), writing composition (n = 1),

vocabulary (n = 1), reading comprehension (n = 1), and listening comprehension (n = 1). Across this sample of special educators, the lowest indicated frequencies were fluency and listening comprehension (M = 2.87), and the most frequently reported content area, on average, was phonics (M = 4.20). Responses varied noticeably across special educators, with standard deviations (SD) ranging from 0.96 – 1.40 across items. Although results varied, generally these results indicate that special educators report spending more time on skills aligned to direct instruction, such as decoding and word recognition. The least frequently reported activities indicate that special educators report spending less time on activities associated with independent reading (i.e., fluency or reading comprehension) or shared meaning-making activities (i.e., listening comprehension).

In contrast, general educators reported the highest average frequencies in addressing listening and reading comprehension (M = 4.75), and the lowest average frequency for phonics (M = 1.25). The majority of general educators (n = 3) reported that they do not provide instruction in phonics or fluency but indicated "*daily*" instruction in reading comprehension. Standard deviations for general educators ranged from 0.50 – 2.00 across items in this scale. Three of the general educators in this sample reported teaching grades 3-4. Grade level standards are likely to prioritize comprehension over decoding at this stage, which may have been reflected in the lower rates of addressing skills like PA and phonics. General educators in this small sample also reported a more frequent focus on writing composition (M = 4.50). The distribution of teacher responses across reported frequencies for addressing literacy content is displayed in Table 4.1.

Table 4.1.
Teacher Reported Frequency of Addressing Content Areas Per Week

Literacy Content Areas	Group	Mean	SD	Not at all (1)	2	3	4	Daily (5)
Phonological Awareness	SPED	3.80	*1.26*	0%	20%	27%	7%	**47%**
	GE	1.75	*0.50*	25%	**75%**	0%	0%	0%
Phonics	SPED	4.20	*1.08*	0%	13%	7%	27%	**53%**
	GE	1.25	*0.50*	**75%**	25%	0%	0%	0%
Reading Texts	SPED	4.07	*0.96*	0%	7%	20%	33%	**40%**
	GE	2.75	*1.70*	25%	25%	25%	0%	25%
Fluency	SPED	2.87	*1.40*	20%	**27%**	13%	**27%**	13%
	GE	2.00	*2.00*	**75%**	0%	0%	0%	25%
Handwriting	SPED	3.67	*1.39*	7%	20%	13%	20%	**40%**
	GE	1.50	*0.57*	**50%**	**50%**	0%	0%	0%
Writing Composition	SPED	3.33	*1.29*	7%	20%	**33%**	13%	27%
	GE	4.50	*0.57*	0%	0%	0%	**50%**	**50%**
Vocabulary	SPED	3.13	*1.18*	7%	20%	**47%**	7%	20%
	GE	3.50	*1.29*	0%	25%	25%	25%	25%
Reading Comprehension	SPED	3.47	*1.18*	7%	7%	**47%**	13%	27%
	GE	4.75	*0.50*	0%	0%	0%	25%	75%
Listening Comprehension	SPED	2.87	*1.06*	7%	**33%**	**33%**	20%	7%
	GE	4.75	*0.50*	0%	0%	0%	25%	**75%**
Oral Language & Communication	SPED	3.87	*1.06*	0%	13%	20%	**33%**	**33%**
	GE	3.25	*1.50*	0%	**50%**	0%	25%	25%
Other	SPED			**33%**	13%	13%	0%	0%
	GE			25%	0%	25%	0%	0%

Note. N = 19 respondents, Special educators n = 15 and General educators n =4. Bolded cells represent the highest porportion of responses by group. Open text responses included in "other" : non-fiction reading/science, spelling, typing skills, "functional reading", and ASL/AAC devices (k =1 for each). "Other" responses included responses unrelated to literacy content (k=3).

Instructional Strategies

In comparison to content areas, respondents reported high rates of daily use of strategies and less variation was observed between general and special educators' reported use of instructional grouping and supports. Most special educators indicated daily use of whole group, small group, individual, and paraprofessional led instruction in their practice. A majority of special educators also reported using assistive and instructional technology daily. The item with the highest average frequency was assistive technology (M = 4.60). The results suggest that special educators report using a variety of instructional groupings and strategies to support students across the school day. In contrast, a small portion of special educators indicated "*not at*

all" for use of whole group instruction (n = 4), paraprofessional led instruction (n = 2), and peer supported learning (n = 5). Overall, peer supported learning had the lowest average frequency (M = 2.40) among special educators. Standard deviations across special educators' responses ranged from 0.99 to 1.82, indicating that responses differed somewhat across this sample. Most items tended to skew positively, with more special educators reporting frequent use. However, overall, special educators reported a high rate of using various instructional strategies in their practices. Further analysis is needed to determine if participants demonstrated desirability bias in their responding by rating themselves highly across strategy and support items.

For general educators, all four respondents indicated that they use both independent learning and whole group instruction daily. Paraprofessional-led instruction and instructional technology were also highly endorsed (3 out of 4 general educators). A single general educator respondent indicated that they do not use assistive technology nor paraprofessional led instruction in their classrooms. These values may reflect variations in classroom composition (i.e., student's require AAC support for access) or school-wide staffing (i.e., no paraprofessional supports are provided). General educators reported the highest average frequencies in using whole group instruction and independent learning (M= 5.00), and the lowest average frequency for assistive technology (M= 3.00). Standard deviations for general educator respondents ranged from 0.00 to 2.00 across items on this scale, but due to the low number of participating educators (n = 4) this should be interpreted cautiously. The distribution of teacher responses across reported frequencies for instructional practices is displayed in Table 4.2.

Table 4.2.
Teacher Reported Frequency Use for Instructional Practices Per Week

Instructional Practices	Group	Mean	SD	Not at all (1)	2	3	4	Daily (5)
Whole Group Instruction	SPED	3.80	*1.82*	27%	0%	7%	0%	**67%**
	GE	5.00	*0.00*	0%	0%	0%	0%	**100%**
Small Group Instruction	SPED	4.53	*1.06*	0%	13%	0%	7%	**80%**
	GE	4.50	*0.58*	0%	0%	0%	**50%**	**50%**
Individual instruction	SPED	4.40	*0.99*	0%	7%	13%	13%	**67%**
	GE	4.25	*1.50*	0%	25%	0%	0%	**75%**
Paraprofessional Led Instruction	SPED	4.27	*1.43*	13%	0%	7%	7%	**73%**
	GE	4.00	*2.00*	25%	0%	0%	0%	**75%**
Assistive Technology	SPED	4.60	*1.12*	7%	0%	7%	0%	**87%**
	GE	3.00	*1.82*	25%	25%	0%	25%	25%
Instructional Technology	SPED	4.27	*1.10*	0%	13%	7%	20%	60%
	GE	4.75	*0.50*	0%	0%	0%	25%	**75%**
Peer Supported Learning	SPED	2.40	*1.50*	**33%**	**33%**	13%	0%	20%
	GE	4.50	*0.58*	0%	0%	0%	50%	50%
Independent Learning	SPED	3.13	*1.40*	13%	20%	**33%**	7%	27%
	GE	5.00	*0.00*	0%	0%	0%	0%	100%
Other Instruction	SPED	1.80	*1.39*	**47%**	0%	13%	0%	7%
	GE	3.00	*1.00*	25%	25%	25%	25%	0%

Note. N = 19 respondents, Special educators n = 15 and General educators n =4. Bolded responses are highest porportion per group. Open text responses included in "other": related services OT/SLP, student book clubs, centers, IEP instruction. "Other" responses included responses unrelated or already listed (i.e, "para led instruction") (k=4).

Repertory Grid

Repertory grid analysis was conducted using a subsample of survey respondents (n = 15 teachers) who completed the spring administration of the survey. This sample included four general educators, three special educators providing inclusive services in co-teaching roles, and eight special educators providing primarily specially designed instruction. Respondents completed a forced choice item asking them to select the three statements that best describe the goal of literacy instruction in their opinion. Nine item statements were presented in random order, with three groups of statements aligned to functional, traditional, or expansive frames of literacy as outlined in Chapter 2. All 15 respondents completed this item, and their responses are outlined in Figure 4.1. In the leftmost column, item statements are listed vertically and grouped into functional, traditional, and expansive belief categories. Individual respondents are grouped horizontally from left to right by their placement (i.e., general educators, inclusive educators, special educators). Participants' individual responses are indicated vertically in columns and marked with squares that correspond to the rows of belief statements from one to nine.

Figure 4.1

Repertory Grid of Functional, Traditional, and Expansive Teacher Beliefs About Literacy

Belief Statements		General Educator				Inclusive Educators			Special Educators								Total
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	
1 Literacy instruction supports functioning in adult life.	Functional					■	■	■	■		■					■	6
2 Literacy instruction is critical for basic safety skills and navigating environments.	Functional		■			■					■	■			■		5
3 Literacy instruction improves independence, adaptive skills, and quality of life.	Functional	■	■	■		■		■	■	■		■	■	■	■	■	12
4 Literacy instruction is a tool for unlocking other learning.	Traditional	■	■	■			■			■	■	■	■	■		■	10
5 Literacy instruction teaches you to comprehend, read, and apply information.	Traditional				■								■				2
6 *Literacy instruction supports progress through grade-level standards.*	Traditional																*0*
7 Literacy instruction helps you access and make connections across texts.	Expansive				■												1
8 Literacy instruction is important to enjoy reading and listening to texts.	Expansive														■		1
9 Literacy learning allows you to communicate your ideas with others.	Expansive	■		■	■		■	■	■	■				■			8

Note. Fifteen respondents completed this item and are listed by identifiers beginning with T. Inclusive Educators are teachers providing co-teaching and inclusive services in grade level classrooms. Special Educators are respondents providing primarily specially designed instruction to students from various grade levels in pull-out settings. Belief statement #6 is italicized because no respondents endorsed that item on this survey.

Functional, Traditional, and Expansive Beliefs

All but one of the belief statements was selected by at least one participant in the survey. Belief #6 "*Literacy instruction supports progress through grade level standards*" was not selected. Beliefs aligned to functional frameworks of literacy were selected the most often with 51.11% of the responses occurring in this category. Traditional literacy beliefs represented 26.67% of the responses, and expansive literacy beliefs represented 22.22% of the responses. The three most frequently endorsed beliefs each aligned to a different framework, specifically functional belief #3: *Literacy instruction improves independence, adaptive skills, and quality of life* (*f* = 12 endorsements), traditional belief #4: *Literacy instruction is a tool for unlocking other learning* (*f* = 10 endorsements), and expansive belief #9: *Literacy learning allows you to communicate your ideas with others* (*f* = 8 endorsements). The least frequently endorsed beliefs include belief #6: *Literacy instruction supports progress through grade level standards* (*f* = 0 endorsements), and belief #7: *Literacy instruction helps you access and make connections across texts* and belief #8: *Literacy instruction is important to enjoy reading and listening to texts* (*f* = 1 endorsement each) which are both aligned to expansive frameworks.

Collectively, these results indicate that, within this sample of educators, their beliefs about literacy instruction are more aligned to functional purposes, rather than traditional or expansive approaches. Very few educators in this sample endorsed beliefs that literacy instruction is important for application of learning, connection with others, or personal enjoyment.

Teacher Responses by Individual and Group

Educator responses tended to spread across two or more categories. Only Teacher 5 selected three statements within a single framework, functional beliefs. Five educators (T1, T3,

T6, T9, and T13) indicated responses across all three categories of frameworks. These findings indicate that, individually, most of the educators in this sample hold a variety of beliefs about the purpose of literacy instruction.

Observing the grid as a scatterplot and grouping teachers by their role, the responses in this sample demonstrate commonalities by placement type. General educators produced an even spread across functional, traditional, and expansive beliefs. Whereas, special educators, including inclusive special educators, produced more dense clusters of responses in functional beliefs about literacy, and similar distributions across beliefs in traditional (Belief #4) and expansive (Belief #9) categories. Some visual similarity is observed between the responses of special educators, who provide specially designed instruction, and inclusive educators who are in co-teaching roles. These results indicate that both individually and within similar groups, educators endorsed beliefs about literacy that spanned multiple frameworks for the purpose of literacy instruction.

RQ2 - 3: Modeling Literacy and Language Growth Trajectories for Children with IDD

As described in the analysis plan, growth models were fitted to the six target literacy and language outcomes that had been measured in fall, winter, spring across one academic year (2023-24) for the sample of children in grades 1-5 with IDD. Descriptive statistics and correlations are reviewed first and followed by modeling results. Full model results for each outcome are presented in Tables 4.5 – 4.10.

Descriptive Statistics and Zero-Order Correlations

The means, standard deviations, and range of participants' raw scores were calculated for each test administration and are reported in Table 4.3. Zero-order correlations were calculated to evaluate correlations between outcome variables at Time 1 and any demographic characteristics

(i.e., grade level, cognitive scores, and adaptative scores) that might act as predictors of student growth in the model. Results indicated significant correlations between subtests within the same assessment, and a slight positive correlation between PC and SXP (r = .44, $p \leq 0.05$), which are from different standardized assessments. Given that expressive language abilities using vocal verbal speech are required to access higher levels of items on both subtests and that expressive language skills are the latent construct of interest for SXP, the positive correlation between raw scores was expected. Since both PC and SXP were modeled independently as outcome variables of interest, this correlation was not a concern. Grade level was significantly positively correlated with all three literacy variables of interest (rs = .77 – .88, $p \leq .001$), and therefore, will be entered into the model as a fixed effect. No evidence of collinearity was observed between predictor variables. All correlations are reported in Table 4.4

Table 4.3

Descriptive Statistics for Variables of Interest in Raw Scores

Measure	Assessment Administration											
	Fall 2023				Winter 2024				Spring 2024			
	n	*M*	*(SD)*	Range	*n*	*M*	*(SD)*	Range	*n*	*M*	*(SD)*	Range
Literacy												
Letter Word Identification	29	21.72	(15.09)	0 - 60	31	21.48	(15.12)	0 - 57	31	24.48	(14.63)	0 - 57
Word Attack	28	7.00	(5.07)	0 - 22	31	5.77	(4.66)	0 - 19	31	7.81	(5.79)	0 - 25
Passage Comprehension	28	8.57	(4.80)	0 - 22	32	8.06	(5.43)	0 - 19	31	9.71	(5.54)	0 - 21
Language												
Receptive Vocabulary	29	19.17	(11.26)	0 - 45	31	20.16	(11.51)	0 - 51	29	22.13	(12.82)	1 - 51
Sentence Expression	28	6.44	(5.55)	0 - 20	27	7.21	(6.72)	0 - 25	28	7.89	(6.62)	0 - 25
Sentence Comprehension	28	8.82	(10.08)	0 - 36	27	8.85	(9.43)	0 - 33	28	10.39	(10.90)	0 - 39

Note. N = 32 students represents the full study sample. Missing data was omitted from descriptive statistics by subtest. Literacy measures are selected subtests from the Woodcock-Johnson Tests of Achievement IV. Language measures are selected subtests of the Comprehensive Assessment of Spoken language (2 ed.)

Table 4.4

Zero-Order Correlations for Student Factors and Outcome Variables of Interest

Measure	*M*	*(SD)*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Outcomes													
1. Letter Word Identification			--										
2.Word Attack			.88 ***	--									
3. Passage Comprehension			.77 ***	.85 ***	--								
4. Receptive Vocabulary			.11	.13	.21	--							
5. Sentence Expression			.25	.26	.44 *	.72 ***	--						
6. Sentence Comprehension			.23	.24	.31	.74 ***	.70 ***	--					
Student Factors													
7. District			-.11	-.25	-.30	-.15	-.24	-.36	--				
8. Inclusive Placement			.12	-.04	.12	.14	.19	.36	-.10	--			
9. Grade			.40 *	.47 *	.49 *	.11	.05	0.1	-.19	.09	--		
10. Cogntive Score			-.20	-.12	-.04	.25	.23	.26	.30	-.10	-.33	--	
11. Adaptive Score			-.03	-.17	.03	-.03	.11	.21	.33	-.25	-.15	.32	--

Note. N=32. Outcome measures 1-3 are subtests from the Woodcock-Johnson Tests of Achievement (4th ed). Outcome measures 4-6 are subtests from the Comprehensive Assessment of Spoken Language (2nd ed.). Inclusive placement was effect coded with Placements A & B = +1 and Placements C & D = -1 to reflect least to most restrictive environments. Cognitive scores were measured using the Matrices subtest of the Kaufman Brief Intelligence Test (2nd ed.) and adaptive scores using the Vineland Adaptive Behavior Scales (3rd ed).

* $p < .05$, ** $p < .01$, *** $p < .001$.

M1: Best-Fitting Linear Growth Trajectories

Recall that three models were fit for each outcome, as previously described. The first model, M1a, included linear time in months as a fixed effect predictor, and allowed children's fall scores (intercept) to freely vary. Model 1b allowed slopes to vary as well, but constrained the correlation between the intercept and slope random effects to 0, which assumes students' intercepts are not predictive of their growth rates. The next model, M1, removed the constraint and allowed the intercepts and slopes to covary (which adds another parameter estimate to the model).

Model Comparisons

Likelihood Ratio Tests (LRTs) were used to determine if the more complex models were better than the simpler models. Across all models, allowing for a random slope fit better than constraining the slope variance (chi-square *p*-values ≤ .05). However, allowing the intercepts and slopes to covary did not significantly improve model fit for any of the six outcomes. Specifically, for LWID, $\chi^2(1) = 0.01$, $p = .941$; for WA, $\chi^2(1) = 0.06$, $p = .807$; for PC, $\chi^2(1) = 0.01$, $p = .941$; for RV, $\chi^2(1) = 0.10$, $p = .763$; for SXP $\chi^2(1) = 0.22$, $p = .639$; and for SCP, $\chi^2(1) = 2.65$, $p = .103$. These results indicate that the second model in the series that allowed for random intercepts and slopes but disallowed for covariance among the terms, henceforth referred to as M1, was the best fitting model across all six outcomes for this sample of children.

Mean Growth Rates

Based on the best-fitting model, there was significant growth for two of the six outcomes: word recognition (LWID) and reading comprehension (PC). Students, on average, increased their word recognition by 0.46 points per month ($\gamma_{01} = 0.46$, $SE = 0.22$, $p \leq .05$) and their reading

comprehension by 0.23 points per month (γ_{01}= 0.23, *SE* = 0.09, $p \leq .05$). R^2 values ranged between 0.00 – 0.01 across variables for M1, indicating that time accounted for little to no change over time across students.

M2: Main Effect of Grade on Growth Trajectories

M2 expanded upon M1 to examine whether grade level (student-level) was predictive of fall scores (intercept) or growth rates (slopes). Recall that grade level is a multi-categorical predictor that was effect-coded using grade 1 as the reference category (coded -1), and that inclusiveness placement was a binary predictor coded +1 if the student was in an inclusive environment for at least 40% of the day or -1 otherwise. For all M2 results, the fixed intercept, or baseline, represents the average score across all participants (γ_{00}) in the fall, and the fixed effect for linear growth over time represents the average rate of change across participants during the school year (γ_{10}). Fixed effects both predictors can be interpreted as differences from the mean.

Comparison with M1

Using the LRT, M2 was a significant or near-significant improvement on model fit over M1 for all literacy outcomes. For LWID, $\chi^2(8) = 14.50$, $p = .069$; for WA, $\chi^2(8) = 17.99$, $p \leq .05$; for PC, $\chi^2(8) = 27.87$, $p \leq 0.001$. R^2 values indicated an improved model fit across variables, with grade level and grade by time interactions accounting for a higher proportion of explained variance in the model. Specifically, R^2 values accounted for 27% of the explained variance in word recognition, 35% of the variance in decoding, and 36% of the variance in reading comprehension. For language variables, R^2 values, derived from fixed effects, accounted for less explained variance but improved upon M1 estimates. Specifically, R^2 values accounted for 13% of the explained variance in vocabulary, 10% of variance in expression, and 12% of the variance in listening comprehension.

Grade Level Effects

Fall scores. Fall means across all six outcomes were significantly different from zero ($p \leq .05$). More interestingly, grade level had a significant main effect on fall scores, with grade 4 students predicted to be significantly higher on all three literacy outcomes. Specifically, students in grade 4 were predicted to score 10.75 points higher than average in word reading ($p \leq .05$), 4.59 points higher in decoding ($p \leq .01$), and 4.99 points higher in reading comprehension ($p \leq .01$), all else held constant. No other grade level differences were observed on intercept values.

Growth rates. The only outcome that exhibited statistically significant *mean* growth in this series of models was for reading comprehension (PC; $p \leq .01$). On this outcome, students were predicted to increase by 0.26 points per month, for an average increase of 1.82 points from fall (Time month = 0) to spring (Time month = 7).

More interestingly, grade level differences in growth rates were evident for reading comprehension: students in grade 3 were predicted to have a faster rate of change of 0.64 points/month compared to the mean growth rate of 0.26 point/month ($p \leq .01$), for a predicted rate of 0.90 points/month. In contrast, students in grade 2 were predicted to have a lower growth rate than average, by 0.66 points/month, culminating in a predicted decrease of 0.40 points/month ($p \leq .001$).

M3: Inclusive Placement Effects on Growth Trajectories

After modeling mean growth trajectories by grade in M2, a third model was constructed to evaluate the effects of educational placement on mean growth trajectories by grade for literacy and language variables. As discussed in chapter three, students within this sample participated in one of four categorical types of placements aligned to federal reporting guidelines (U.S. Department of Education, 2020), ranging from fully inclusive (Placement A) to separate school

settings (Placement D). Inclusive Placement (IP) was effect coded as +1 for Placements A & B, and coded as -1 for students in placements C & D. The final model, M3, expanded upon M2 by adding access to inclusive placements as a level 2 fixed effect (γ_{05}) and examined the cross-level interactions between time (level 1), grade level (level 2), and access to inclusive placements (level 2). Results for all models are presented in Tables 4.5 – 4.10.

Comparison with M2

The addition of inclusive placement effects and its interaction with grade level (M3) had significant or near-significant improved model fit compared to M2. Specifically, for decoding, LRT $\chi^2(10) = 19.12$, $p \leq .05$; for reading comprehension, LRT $\chi^2(10) = 23.11$, $p \leq .05$, and for receptive vocabulary, LRT $\chi^2(10) = 17.17$, $p = .070$. R^2 values for literacy variables increased from 27% to 51% explained variance for word recognition, 35% to 51% explained variance for decoding, and 36% to 55% explained variance for reading comprehension. Explained variance for language variables also increased with the addition of placement effects; specifically, R^2 values increased from 13% to 36% for receptive vocabulary, 10% to 34% for expression, and 12% to 40% for listening comprehension.

Table 4.5

Growth Modeling Results for Word Recognition by Grade Level and Educational Placement

	Model 1					Model 2					Model 3				
Fixed Effects	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*
Intercept (Wave 1)	**20.07**	**2.69**	**7.45**	**37** ***	**1.34**	**19.71**	**2.55**	**7.74**	**40** ***	**1.39**	**22.18**	**2.29**	**9.71**	**42** ***	**1.74**
Linear Growth	**0.46**	**0.22**	**2.10**	**57** *	**0.38**	0.45	0.24	1.92	57 ·	0.34	0.45	0.25	1.80	57 ·	0.32
Grade 2						-1.01	5.57	-0.18	38	-0.03	2.16	5.19	0.42	41	0.07
Grade 3						-1.17	6.46	-0.18	42	-0.03	-3.15	5.59	-0.56	45	-0.10
Grade 4						**10.75**	**4.32**	**2.49**	**38** *	**0.45**	**10.40**	**4.00**	**2.60**	**41** *	**0.47**
Grade 5						1.61	4.40	0.37	41	0.07	4.81	4.04	1.19	43	0.21
Time*Gr2						-0.99	0.50	-1.99	57 ·	-0.36	-0.81	0.55	-1.46	57	-0.26
Time*Gr3						0.67	0.63	1.07	58	0.19	0.57	0.62	0.92	58	0.16
Time*Gr4						0.12	0.39	0.30	57	0.05	-0.02	0.43	-0.05	57	-0.01
Time*Gr5						-0.10	0.42	-0.25	57	-0.04	-0.04	0.44	-0.08	57	-0.01
Inclusive Placement (IP)											**5.89**	**2.29**	**2.58**	**43** *	**0.46**
Gr2*IP											5.44	5.19	1.05	41	0.19
Gr3*IP											-1.08	5.60	-0.19	45	-0.03
Gr4*IP											**-10.14**	**4.00**	**-2.53**	**41** *	**-0.45**
Gr5*IP											5.29	4.04	1.31	43	0.23
Time*IP											-0.02	0.25	-0.06	57	-0.01
Time*Gr2*IP											0.37	0.55	0.68	57	0.12
Time*Gr3*IP											-0.86	0.62	-1.38	58	-0.25
Time*Gr4*IP											0.30	0.43	0.70	57	0.13
Time*Gr5*IP											0.17	0.44	0.39	57	0.07
Random Effects	*Var*					*Var*					*Var*				
Intercept (Baseline)	193.39					136.60					83.10				
Linear Growth	0.00					0.00					0.00				
Residual	33.52					31.10					29.87				
Model Fit															
Marginal R^2	0.01					0.27					0.51				
Residual *df*	83					75					65				
LRT Chi-square test	--					14.50 ·					10.47				

Note. N = 31 students measured at three timepoints over one academic year (Fall, Winter, Spring); Word Recognition outcomes measured as raw score values on the WJIV Letter Word Identitification subtest. Time coded in months from Wave 1 (Time = 0); Categorical predictors are effect coded: Grade level with Grade 1 as the reference category (-1) and all else as 0, Inclusive Placements (IP) effect coded with Placements A & B as +1 and Placement C & D as -1. *ES* = effect size, calculated as the coefficient divided by the product of the standard error and square root of N. Marginal R^2 calculated as the total fitted variance. Model estimated using *R* lme4, lmerTest, and r2mlm packages.

· $p < .01$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4.6

Growth Modeling Results for Decoding by Grade Level and Educational Placement

	Model 1					Model 2					Model 3				
Fixed Effects	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*
Intercept (Wave 1)	**5.88**	**0.91**	**6.49**	**36** ***	**1.17**	**5.50**	**0.81**	**6.76**	**41** ***	**1.21**	**6.39**	**0.72**	**8.90**	**44** ***	**1.60**
Linear Growth	0.19	0.11	1.71	35 ·	0.31	0.22	0.12	1.87	39 ·	0.34	**0.26**	**0.12**	**2.19**	**43** *	**0.39**
Grade 2						0.43	1.75	0.25	38	0.04	0.94	1.61	0.59	42	0.10
Grade 3						-2.70	2.10	-1.29	45	-0.23	-3.23	1.78	-1.82	47 ·	-0.33
Grade 4						**4.59**	**1.36**	**3.37**	**38** **	**0.61**	**5.41**	**1.24**	**4.37**	**42** ***	**0.79**
Grade 5						0.57	1.41	0.41	42	0.07	1.13	1.26	0.90	44	0.16
Time*Gr2						-0.29	0.24	-1.18	36	-0.21	-0.17	0.27	-0.63	41	-0.11
Time*Gr3						0.41	0.30	1.36	43	0.24	0.34	0.30	1.14	46	0.20
Time*Gr4						0.11	0.19	0.55	37	0.10	0.07	0.21	0.34	41	0.06
Time*Gr5						-0.15	0.20	-0.74	41	-0.13	-0.16	0.21	-0.75	43	-0.13
Inclusive Placement											0.89	0.72	1.24	44	0.22
Gr2*Inclusive Placement											1.95	1.60	1.21	42	0.22
Gr3*Inclusive Placement											-0.05	1.77	-0.30	47	-0.01
Gr4*Inclusive Placement											**-4.33**	**1.24**	**-3.50**	**42** **	**-0.63**
Gr5*Inclusive Placement											1.83	1.26	1.45	44	0.26
Time*Inclusive Placment											0.06	0.12	0.48	43	0.09
Time*Gr2*Inclusive Placement											0.27	0.27	1.03	41	0.19
Time*Gr3*Inclusive Placement											-0.09	0.30	-0.29	46	-0.05
Time*Gr4*Inclusive Placement											-0.08	0.21	-0.40	41	-0.07
Time*Gr5*Inclusive Placement											0.05	0.21	0.24	43	0.04
Random Effects	*Var*					*Var*					*Var*				
Intercept (Baseline)	19.72					11.19					5.32				
Linear Growth	0.11					0.08					0.04				
Residual	5.73					5.64					5.85				
Model Fit															
Marginal R^2	0.01					0.35					0.51				
Residual *df*	82					74					64				
LRT Chi-square test	--					**17.99** *					**19.12** *				

Note. N = 31 students measured at three timepoints over one academic year (Fall, Winter, Spring); Decoding outcomes measured as raw score values on the WJIV Word Attack subtest. Time coded in months from Wave 1 (Time = 0); Categorical predictors are effect coded: Grade level with Grade 1 as the reference category (-1) and all else as 0, Inclusive Placements (IP) effect coded with Placements A & B as +1 and Placement C & D as -1. *ES* = effect size, calculated as the coefficient divided by the product of the standard error and square root of N. Marginal R^2 calculated as the total fitted variance. Model estimated using *R* lme4, lmerTest, and r2mlm packages.

· $p < .01$,* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4.7

Growth Modeling Results for Reading Comprehension by Grade Level and Educational Placement

	Model 1					Model 2					Model 3				
Fixed Effects	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*
Intercept (Wave 1)	**7.47**	**0.91**	**8.19**	**34** ***	**1.47**	**6.76**	**0.83**	**8.13**	**37** ***	**1.46**	**7.48**	**0.77**	**9.72**	**41** ***	**1.75**
Linear Growth	**0.23**	**0.09**	**2.49**	**31** *	**0.45**	**0.26**	**0.08**	**3.22**	**34** **	**0.58**	**0.28**	**0.08**	**3.56**	**57** ***	**0.64**
Grade 2						-0.30	1.81	-0.16	34	-0.03	-0.29	1.74	-0.16	39	-0.03
Grade 3						-3.67	2.11	-1.74	39 ·	-0.31	-3.60	1.88	-1.92	43 ·	-0.34
Grade 4						**4.99**	**1.41**	**3.54**	**35** **	**0.64**	**5.13**	**1.35**	**3.81**	**39** ***	**0.68**
Grade 5						1.41	1.44	0.98	37	0.18	2.27	1.36	1.67	41	0.30
Time*Gr2						**-0.66**	**0.17**	**-3.81**	**31** ***	**-0.69**	**-0.54**	**0.17**	**-3.16**	**57** **	**-0.57**
Time*Gr3						**0.64**	**0.22**	**2.95**	**37** **	**0.53**	**0.56**	**0.19**	**2.92**	**58** **	**0.53**
Time*Gr4						0.02	0.14	0.16	32	0.03	-0.04	0.13	-0.28	57	-0.05
Time*Gr5						-0.10	0.14	-0.70	35	-0.13	-0.01	0.14	-0.07	57	-0.01
Inclusive Placement											**1.77**	**0.77**	**2.30**	**41** *	**0.41**
Gr2*Inclusive Placement											-0.30	1.74	-0.17	39	-0.03
Gr3*Inclusive Placement											2.68	1.88	1.43	43	0.26
Gr4*Inclusive Placement											**-3.49**	**1.35**	**-2.59**	**39** *	**-0.47**
Gr5*Inclusive Placement											1.23	1.36	0.91	41	0.16
Time*Inclusive Placment											0.04	0.08	0.52	57	0.09
Time*Gr2*Inclusive Placement											0.22	0.17	1.31	57	0.24
Time*Gr3*Inclusive Placement											**-0.59**	**0.19**	**-3.07**	**58** **	**-0.55**
Time*Gr4*Inclusive Placement											0.06	0.13	0.42	57	0.07
Time*Gr5*Inclusive Placement											0.19	0.14	1.43	57	0.26
Random Effects	*Var*					*Var*					*Var*				
Intercept (Baseline)	22.29					14.68					9.90				
Linear Growth	0.10					0.03					0.00				
Residual	3.38					3.11					2.81				
Model Fit															
Marginal R^2	0.01					0.36					0.55				
Residual *df*	83					75					65				
LRT Chi-square test						**27.87** ***					**23.11** *				

Note. N = 31 students measured at three timepoints over one academic year (Fall, Winter, Spring); Reading Comprehension outcomes measured as raw score values on the WJIV Passage Comprehension subtest. Time coded in months from Wave 1 (Time = 0); Categorical predictors are effect coded: Grade level with Grade 1 as the reference category (-1) and all else as 0, Inclusive Placements (IP) effect coded with Placements A & B as +1 and Placement C & D as -1. *ES* = effect size, calculated as the coefficient divided by the product of the standard error and square root of N. Marginal R^2 calculated as the total fitted variance. Model estimated using *R* lme4, lmerTest, and r2mlm packages.

· $p < .01$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Growth Modeling Results for Receptive Vocabulary by Grade Level and Educational Placement

	Model 1					Model 2					Model 3				
Fixed Effects	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*
Intercept (Wave 1)	**17.86**	**1.93**	**9.27**	**36** ***	**1.66**	**17.16**	**2.07**	**8.30**	**39** ***	**1.49**	**18.30**	**2.00**	**9.14**	**44** ***	**1.64**
Linear Growth	0.42	0.29	1.46	34	0.26	0.37	0.31	1.19	38	0.21	0.51	0.29	1.78	43 ·	0.32
Grade 2						1.13	4.35	0.26	35	0.05	3.12	4.44	0.70	41	0.13
Grade 3						-4.83	5.56	-0.87	44	-0.16	-4.80	5.12	-0.94	48	-0.17
Grade 4						5.62	3.40	1.65	36	0.30	3.94	3.44	1.15	41	0.21
Grade 5						1.12	3.54	0.32	40	0.06	2.57	3.50	0.73	43	0.13
Time*Gr2						-0.81	0.65	-1.25	34	-0.22	-0.81	0.64	-1.27	40	-0.23
Time*Gr3						0.30	0.82	0.37	44	0.07	0.39	0.73	0.53	48	0.10
Time*Gr4						0.42	0.51	0.82	35	0.15	0.24	0.50	0.48	40	0.09
Time*Gr5						-0.22	0.55	-0.40	37	-0.07	0.13	0.51	0.25	41	0.05
Inclusive Placement											1.87	2.00	0.93	44	0.17
Gr2*Inclusive Placement											4.38	4.44	0.99	41	0.18
Gr3*Inclusive Placement											-7.57	5.12	-1.48	48	-0.27
Gr4*Inclusive Placement											-0.79	3.44	-0.23	41	-0.04
Gr5*Inclusive Placement											3.25	3.50	0.93	43	0.17
Time*Inclusive Placment											**0.76**	**0.29**	**2.63**	**43** *	**0.47**
Time*Gr2*Inclusive Placement											-0.46	0.64	-0.73	40	-0.13
Time*Gr3*Inclusive Placement											1.21	0.73	1.65	48	0.30
Time*Gr4*Inclusive Placement											-0.69	0.50	-1.39	40	-0.25
Time*Gr5*Inclusive Placement											0.23	0.51	0.46	41	0.08
Random Effects	*Var*					*Var*					*Var*				
Intercept (Baseline)	79.93					67.90					47.31				
Linear Growth	1.07					0.87					0.24				
Residual	35.13					35.17					37.02				
Model Fit															
Marginal R^2	0.01					0.13					0.36				
Residual *df*	83					75					65				
LRT Chi-square test						6.68					17.17 ·				

Note. N = 31 students measured at three timepoints over one academic year (Fall, Winter, Spring); Vocabulary outcomes measured as raw score values on the CASL-2 Receptive Vocabulary subtest. Time coded in months from Wave 1 (Time = 0); Categorical predictors are effect coded: Grade level with Grade 1 as the reference category (-1) and all else as 0, Inclusive Placements (IP) effect coded with Placements A & B as +1 and Placement C & D as -1. *ES* = effect size, calculated as the coefficient divided by the product of the standard error and square root of N. Marginal R^2 calculated as the total fitted variance. Model estimated using *R* lme4, lmerTest, and r2mlm packages.

· $p < .01$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4.9

Growth Modeling Results for Sentence Expression by Grade Level and Educational Placement

	Model 1					Model 2					Model 3				
Fixed Effects	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*
Intercept (Wave 1)	**6.06**	**1.06**	**5.72**	**33** ***	**1.03**	**5.09**	**1.13**	**4.51**	**35** ***	**0.81**	**5.59**	**1.07**	**5.23**	**36** ***	**0.94**
Linear Growth	0.19	0.16	1.17	32	0.21	0.27	0.17	1.55	34	0.28	0.37	0.19	1.98	36 ·	0.36
Grade 2						-1.22	2.33	-0.52	31	-0.09	-3.06	2.24	-1.36	34	-0.24
Grade 3						-4.42	2.98	-1.48	39	-0.27	-4.13	2.61	-1.58	39	-0.28
Grade 4						2.94	1.83	1.61	32	0.29	2.40	1.76	1.37	34	0.25
Grade 5						0.55	1.95	0.28	34	0.05	2.30	1.81	1.27	35	0.23
Time*Gr2						-0.24	0.36	-0.66	31	-0.12	-0.30	0.40	-0.76	34	-0.14
Time*Gr3						0.51	0.45	1.13	41	0.20	0.50	0.45	1.13	42	0.20
Time*Gr4						-0.20	0.28	-0.70	32	-0.13	-0.21	0.31	-0.68	35	-0.12
Time*Gr5						-0.05	0.31	-0.17	32	-0.03	-0.09	0.32	-0.28	35	-0.05
Inclusive Placement											0.49	1.07	0.46	36	0.08
Gr2*Inclusive Placement											-3.18	1.24	-1.42	34	-0.46
Gr3*Inclusive Placement											0.36	2.61	0.14	39	0.02
Gr4*Inclusive Placement											-0.41	1.76	-0.23	34	-0.04
Gr5*Inclusive Placement											**4.96**	**1.81**	**2.74**	**35** **	**0.49**
Time*Inclusive Placment											0.03	0.19	0.19	36	0.03
Time*Gr2*Inclusive Placement											0.03	0.40	0.08	34	0.01
Time*Gr3*Inclusive Placement											0.46	0.45	1.04	42	0.19
Time*Gr4*Inclusive Placement											-0.22	0.31	-0.69	35	-0.12
Time*Gr5*Inclusive Placement											0.10	0.32	0.30	35	0.05
Random Effects	*Var*					*Var*					*Var*				
Intercept (Wave 1)	20.69					18.48					10.42				
Linear Growth	0.28					0.26					0.21				
Residual	11.23					10.83					10.79				
Model Fit															
Marginal R^2	0.01					0.10					0.34				
Residual *df*	75					67					57				
LRT Chi-square test						5.08					13.81				

Note. N = 31 students measured at three timepoints over one academic year (Fall, Winter, Spring); Expression outcomes measured as raw score values on the CASL-2 Sentence Expression subtest. Time coded in months from Wave 1 (Time = 0); Categorical predictors are effect coded: Grade level with Grade 1 as the reference category (-1) and all else as 0, Inclusive Placements (IP) effect coded with Placements A & B as +1 and Placement C & D as -1. *ES* = effect size, calculated as the coefficient divided by the product of the standard error and square root of N. Marginal R^2 calculated as the total fitted variance. Model estimated using *R* lme4, lmerTest, and r2mlm packages.

· $p < .01$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4.10

Growth Modeling Results for Listening Comprehension by Grade Level and Educational Placement

	Model 1					Model 2					Model 3				
Fixed Effects	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*	*Coeff*	*SE*	*t*	*df*	*ES*
Intercept (Wave 1)	**8.02**	**1.67**	**4.79**	**35** ***	**0.86**	**6.84**	**1.76**	**3.90**	**37** ***	**0.70**	**8.29**	**1.52**	**5.45**	**43** ***	**0.98**
Linear Growth	0.22	0.26	0.86	34	0.15	0.21	0.28	0.77	37	0.14	0.25	0.28	0.90	42	0.16
Grade 2						-1.74	3.70	-0.47	34	-0.08	-0.53	3.41	-0.16	43	-0.03
Grade 3						-5.55	4.68	-1.19	41	-0.21	-6.96	3.87	-1.80	45 ·	-0.32
Grade 4						5.62	2.97	1.89	36	0.34	4.99	2.62	1.90	41 ·	0.34
Grade 5						1.35	2.99	0.45	38	0.08	4.43	2.64	1.68	42	0.30
Time*Gr2						-0.28	0.59	-0.48	33	-0.09	-0.48	0.62	-0.77	39	-0.14
Time*Gr3						0.16	0.73	0.22	41	0.04	0.11	0.69	0.15	47	0.03
Time*Gr4						0.21	0.47	0.45	36	0.08	0.31	0.48	0.63	41	0.11
Time*Gr5						-0.06	0.49	-0.12	37	-0.02	0.11	0.49	0.23	42	0.04
Inclusive Placement											**3.36**	**1.52**	**2.21**	**43** *	**0.40**
Gr2*Inclusive Placement											1.88	3.41	0.55	43	0.10
Gr3*Inclusive Placement											-3.04	3.87	-0.78	45	-0.14
Gr4*Inclusive Placement											-4.88	2.62	-1.86	41 ·	-0.33
Gr5*Inclusive Placement											**6.26**	**2.64**	**2.37**	**42** *	**0.43**
Time*Inclusive Placment											-0.08	0.28	-0.31	42	-0.05
Time*Gr2*Inclusive Placement											-0.24	0.62	-0.38	39	-0.07
Time*Gr3*Inclusive Placement											0.01	0.69	0.01	47	0.00
Time*Gr4*Inclusive Placement											-0.19	0.48	-0.39	41	-0.07
Time*Gr5*Inclusive Placement											0.40	0.49	0.82	42	0.15
Random Effects	*Var*					*Var*					*Var*				
Intercept (Wave 1)	66.44					54.83					25.85				
Linear Growth	1.25					1.13					0.74				
Residual	16.74					17.53					21.40				
Model Fit															
Marginal R^2	0.00					0.12					0.40				
Residual *df*	78					70					60				
LRT Chi-square test						4.88 ·					15.73				

Note. N = 31 students measured at three timepoints over one academic year (Fall, Winter, Spring); Listening Coomprehension outcomes measured as raw score values on the CASL-2 Sentence Comprehension subtest. Time coded in months from Wave 1 (Time = 0); Categorical predictors are effect coded: Grade level with Grade 1 as the reference category (-1) and all else as 0, Inclusive Placements (IP) effect coded with Placements A & B as +1 and Placement C & D as -1. *ES* = effect size, calculated as the coefficient divided by the product of the standard error and square root of N. Marginal R^2 calculated as the total fitted variance. Model estimated using *R* lme4, lmerTest, and r2mlm packages.

· $p < .01$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Growth Parameters

As previously observed for M2, the results for M3 show that average fall scores were significantly different from zero (i.e., significant intercepts, *p*s ≤ .05). As well, there was significant mean linear growth detected for two of the three literacy variables: decoding (WA) and reading comprehension (PC). Specifically, decoding, on average was predicted to increase by 0.26 points/month ($p \leq .05$), and reading comprehension was predicted to increase by 0.28 points/month on average ($p \leq .001$). (Predicted mean growth trajectories by student are plotted by each of the six outcome variables in Figure 4.2.)

Grade Level Effects

Grade level differences persisted from M2 to M3 and can be observed in the predicted mean growth trajectories by grade level are displayed in Figures 4.3 – 4.8. Compared to fall average scores, grade 4 students were predicted to be higher on word reading ($\gamma_{03} = 10.40$, $p \leq .05$), decoding (5.41, $p \leq .001$), and reading comprehension (5.13, $p \leq .001$). As well, grade level differences in growth rates were apparent for reading comprehension: students in grade 3 were predicted to have a faster rate of change of 0.56 points/month compared to the mean growth rate of 0.28 point/month ($p \leq .01$), for a predicted rate of 0.84 points/month; in contrast, students in grade 2 were predicted to have a lower growth rate than average, by 0.54 points/month, culminating in a predicted decrease of 0.26 points/month ($p \leq .001$).

Figure 4.2

Mean Predicted Student Trajectories for Literacy and Language Variables

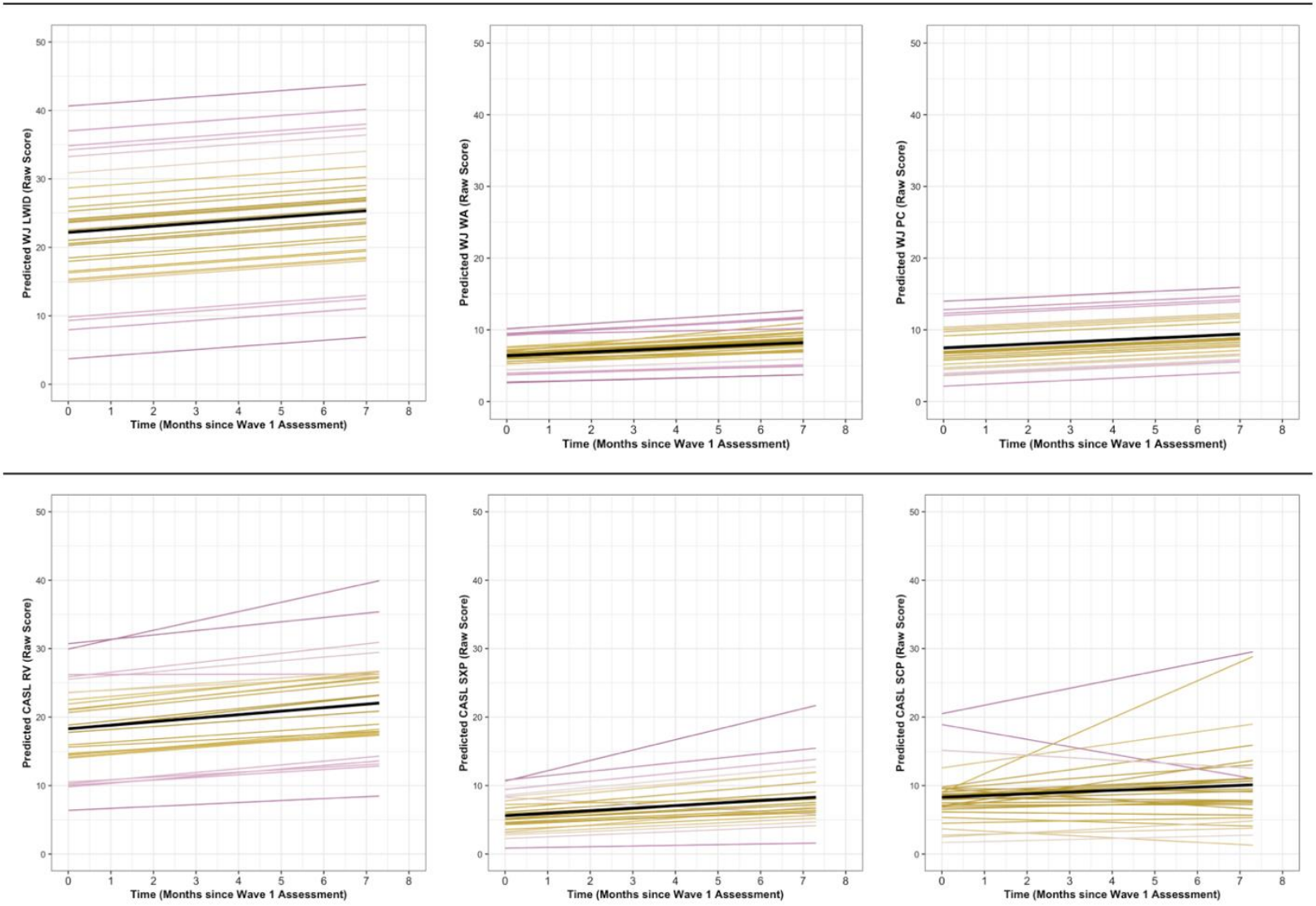


Figure 4.3

Predicted Mean Grade Level Trajectories for Word Recognition

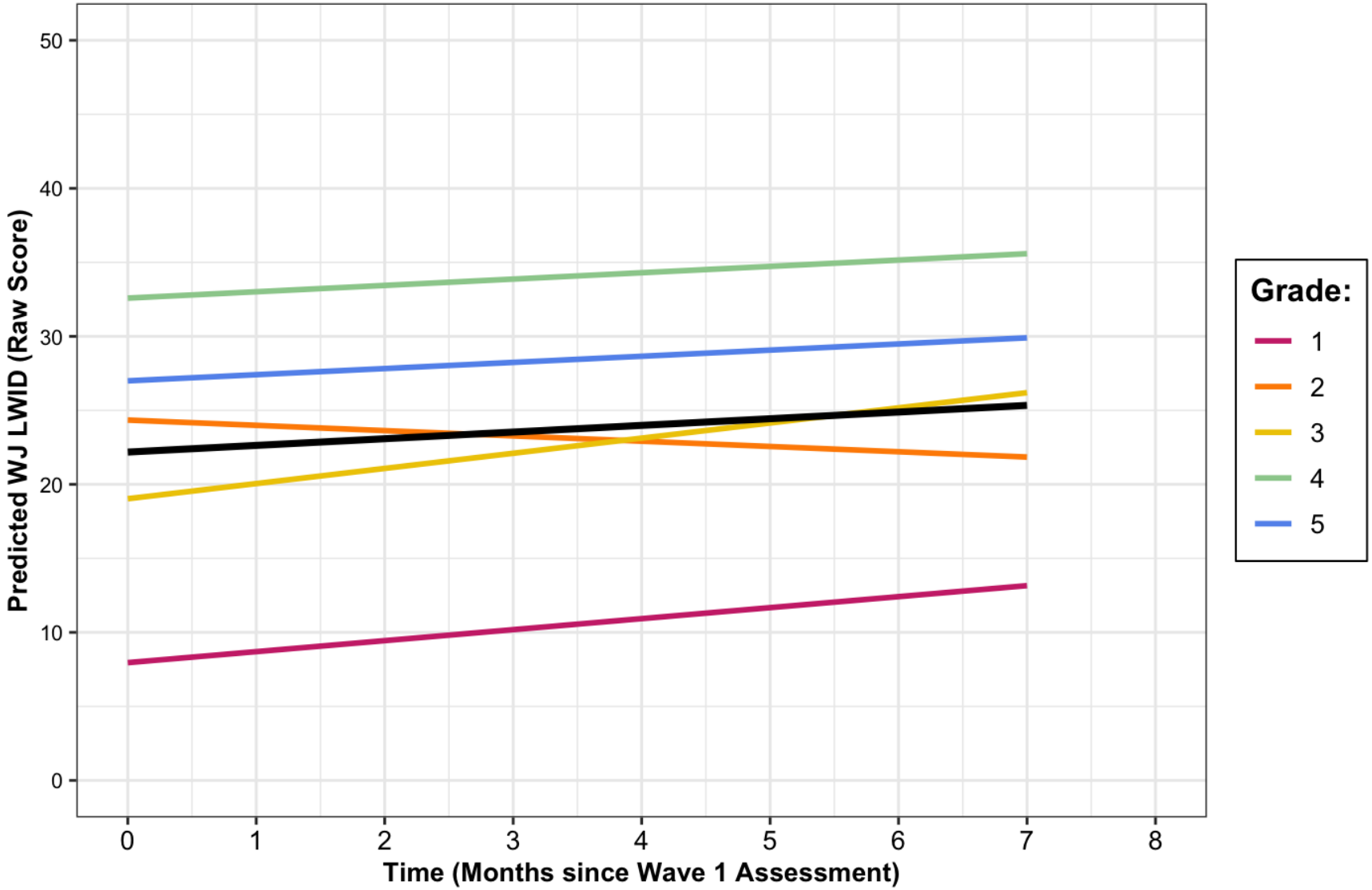


Figure 4.4

Predicted Mean Grade Level Trajectories for Decoding

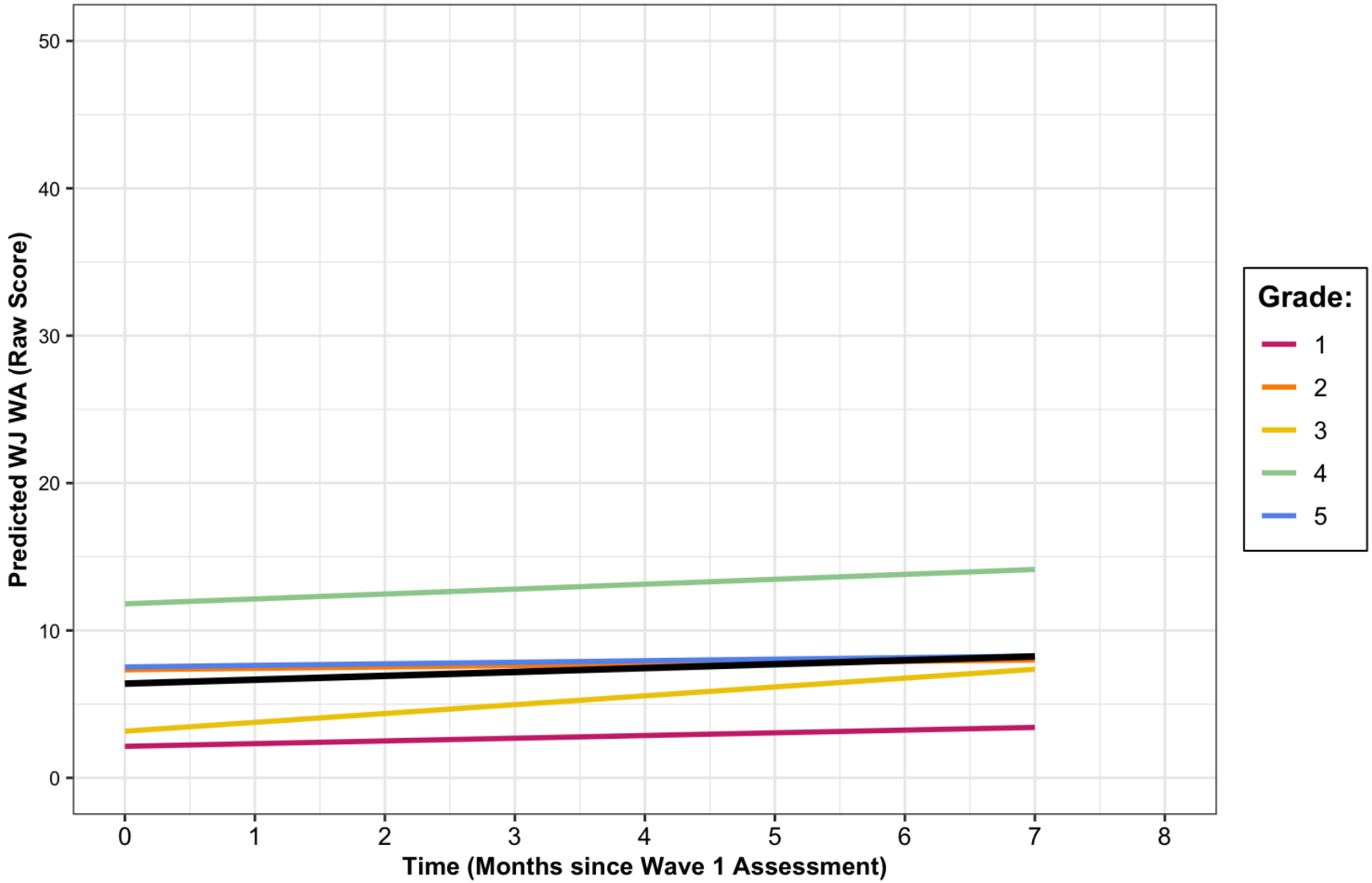


Figure 4.5

Predicted Mean Grade Level Trajectories for Reading Comprehension

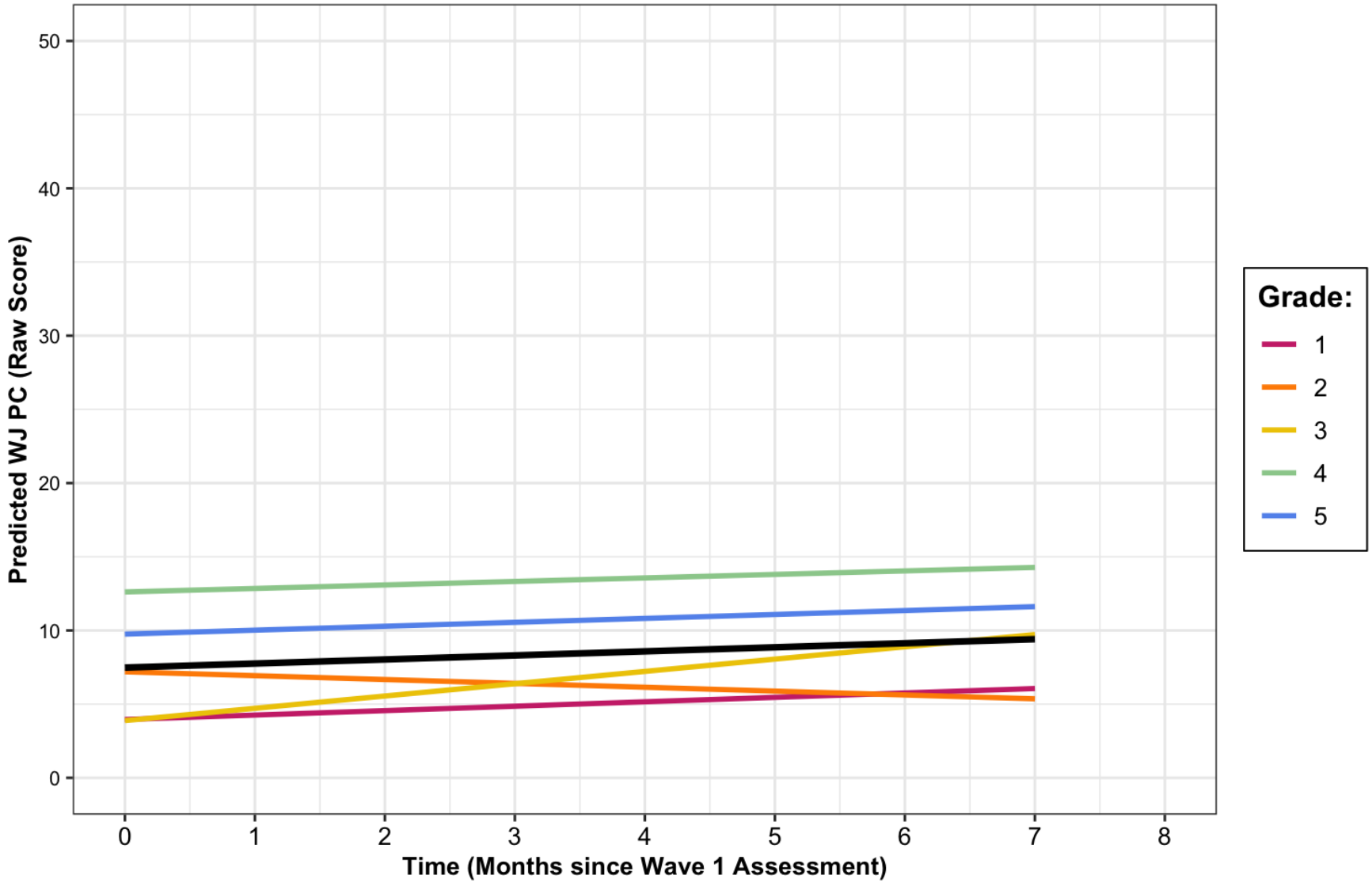


Figure 4.6

Predicted Mean Grade Level Trajectories for Vocabulary

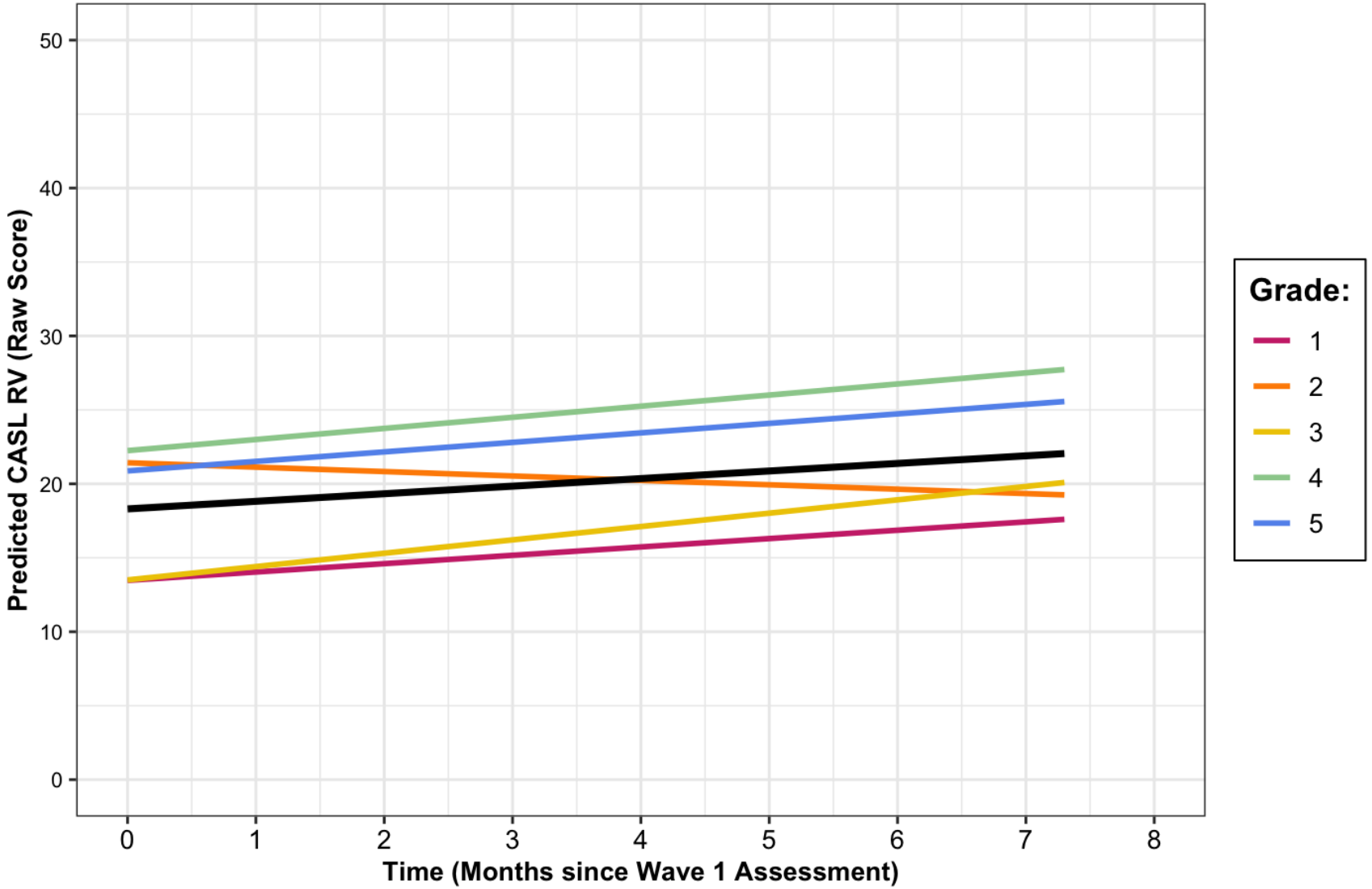


Figure 4.7

Predicted Mean Grade Level Trajectories for Expression

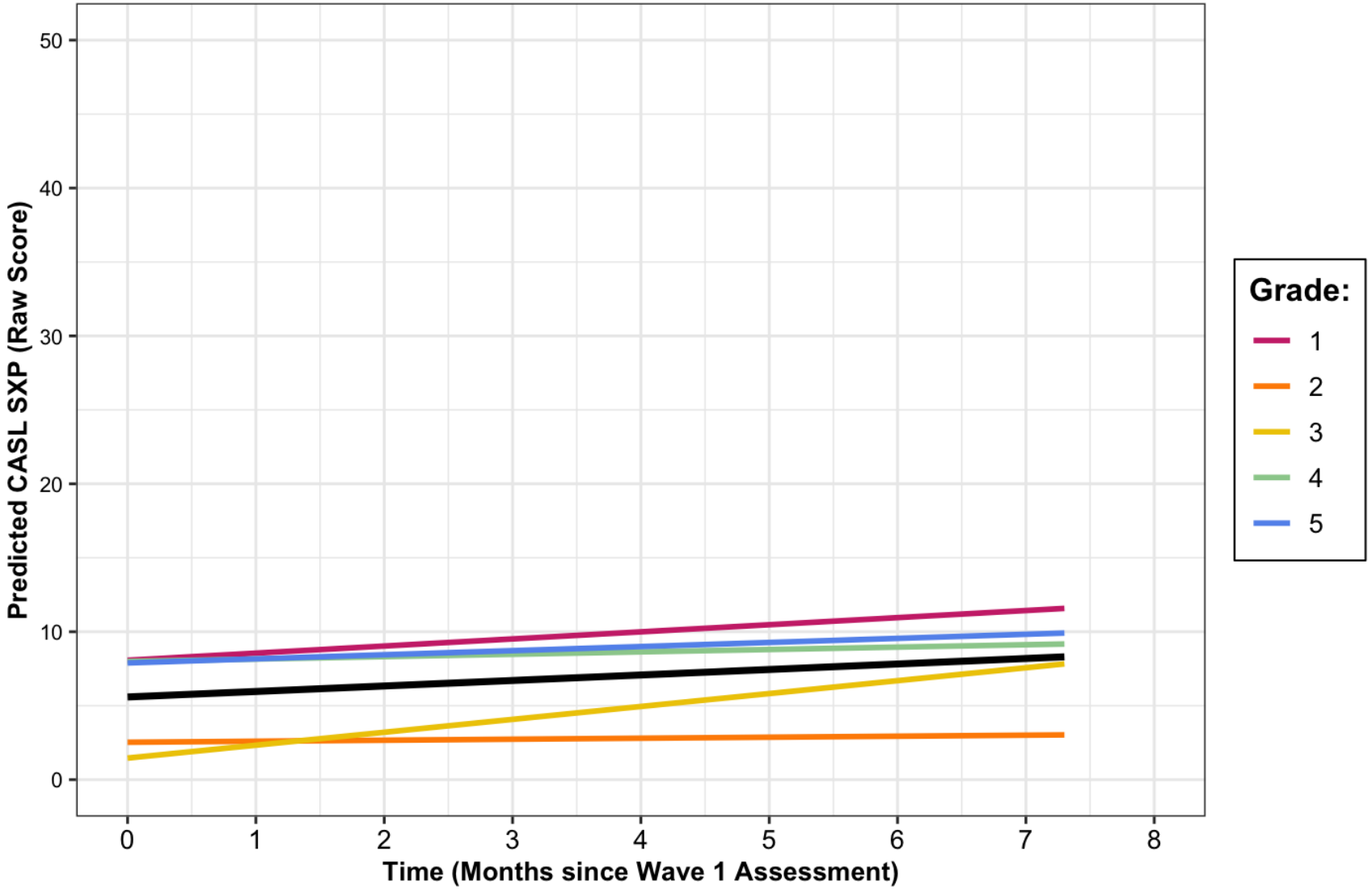
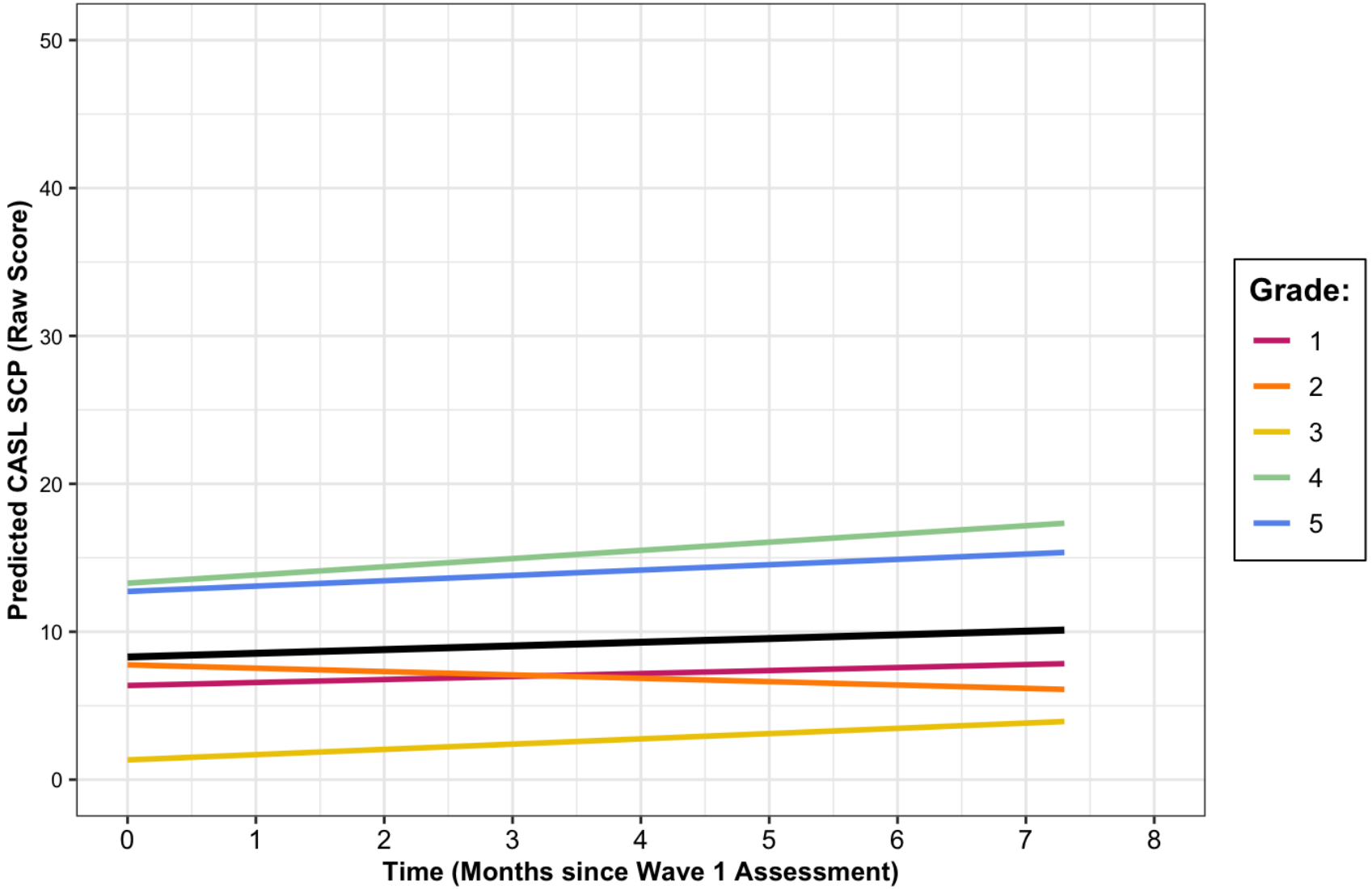


Figure 4.8

Predicted Mean Grade Level Trajectories for Listening Comprehension



Inclusive Placement Effects

Students who were in an inclusive classroom placement were significantly higher than average in the fall on word recognition (5.89, $p \leq .05$), reading comprehension (1.77, $p \leq .05$), and listening comprehension (3.36, $p \leq .05$). Since inclusive placement was effect-coded, the value of the coefficient is doubled to determine the predicted difference between students who were in inclusive classrooms (Placements A & B) compared to those in less inclusive placements (Placements C & D). This translates to a difference of 11.78 points on word recognition, 3.54 points on reading comprehension, and 6.72 points on listening comprehension. Inclusive placement also had a significant effect on the receptive vocabulary growth rate ($p \leq .05$). Specifically, with all else held constant, growth in receptive vocabulary was predicted to be 1.52 points/month higher for students accessing inclusive placements when compared to students in more restrictive settings.

Interactions Between Grade and Inclusive Placement

The inclusive placement main effects are conditional on the significant interactions found between grade level and inclusive placement: with the one exception of receptive vocabulary, grade level significantly interacted with inclusive placement on fall scores (intercept) for each of the outcomes. As well, for reading comprehension, there was an interaction between grade level and inclusive placement on growth rates. To better understand these interactions, Figures 4.9-4.14 display the differences in predicted mean growth trajectories for students in inclusive vs. non-inclusive placements by grade level for each of the six outcomes.

Figure 4.9

A Comparison of Predicted Mean Growth in Word Recognition by Placement and Grade Level

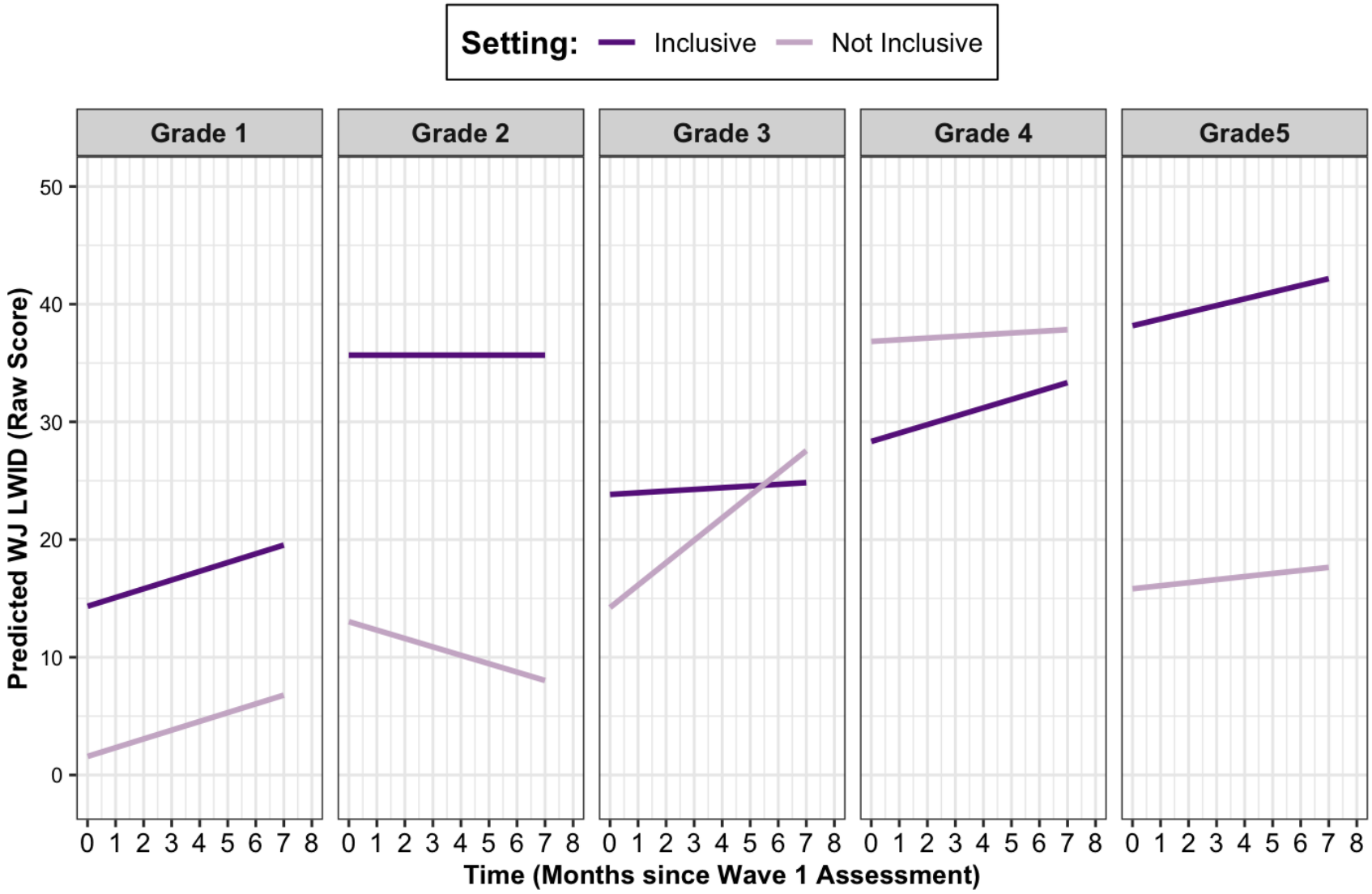


Figure 4.10

A Comparison of Predicted Mean Growth in Decoding by Placement and Grade Level

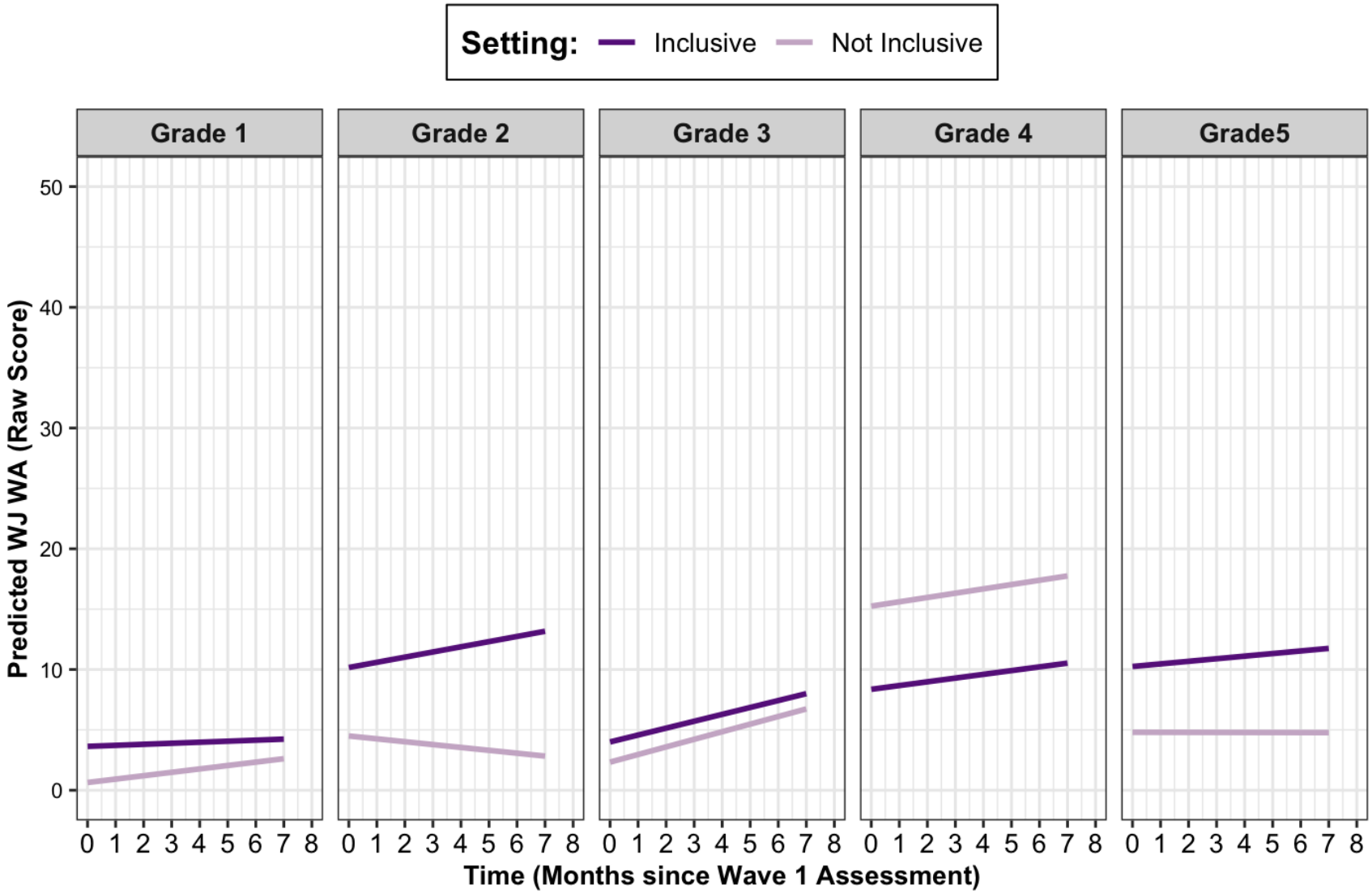


Figure 4.11

A Comparison of Predicted Mean Growth in Reading Comprehension by Placements and Grade Level

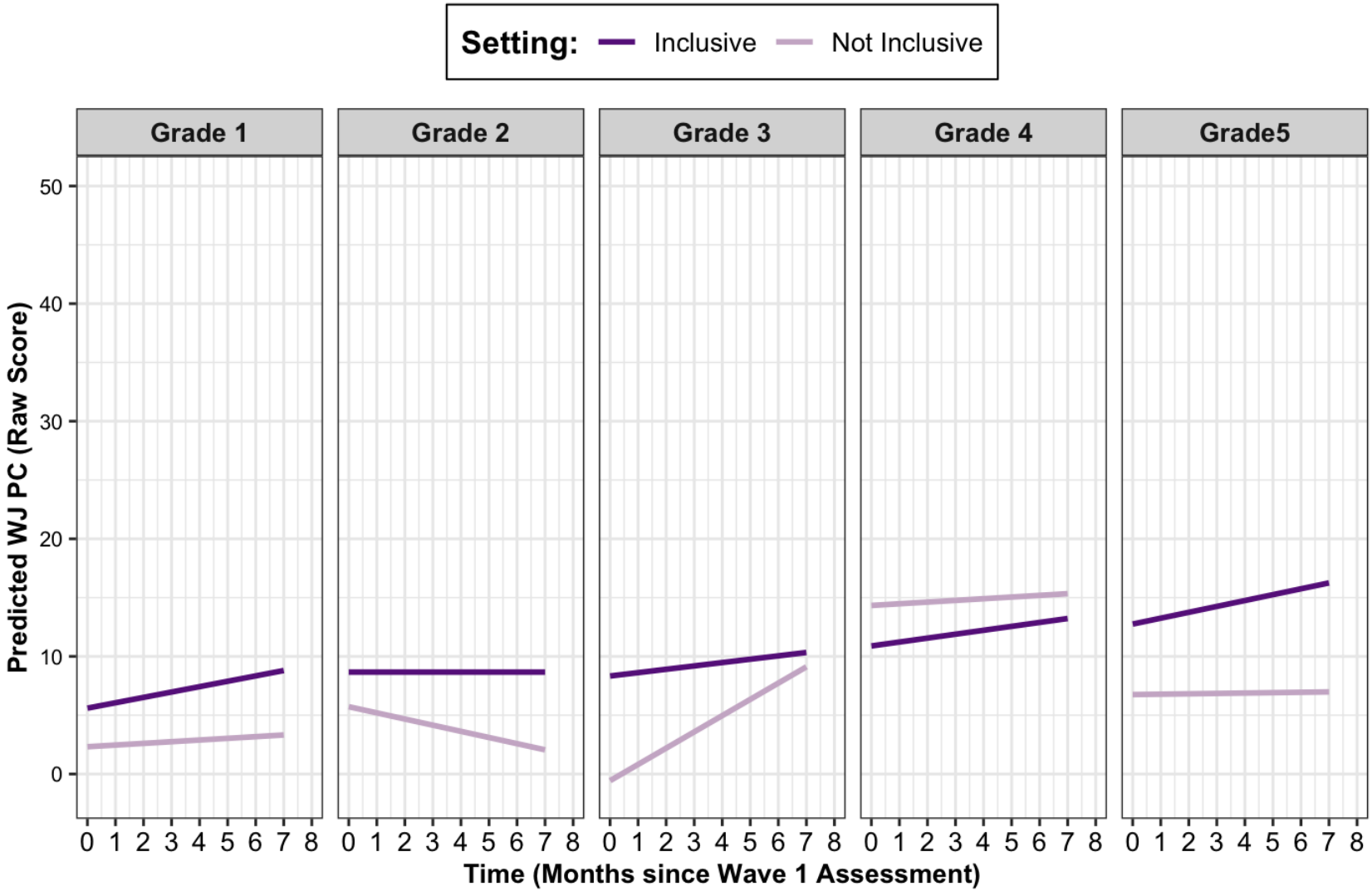


Figure 4.12

A Comparison of Predicted Mean Growth in Vocabulary by Placements and Grade Level

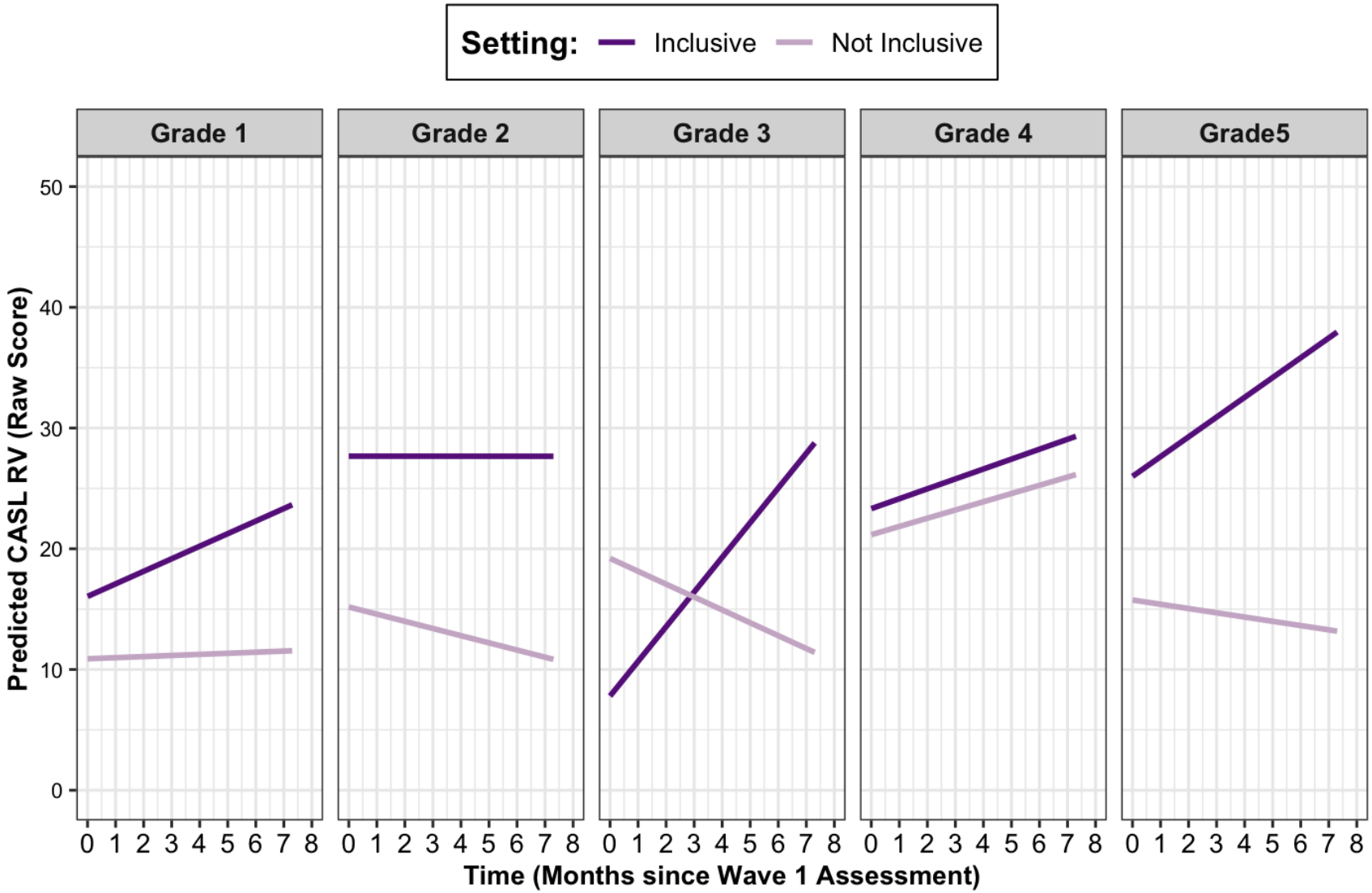


Figure 4.13

A Comparison of Predicted Mean Growth in Expression by Placement and Grade Level

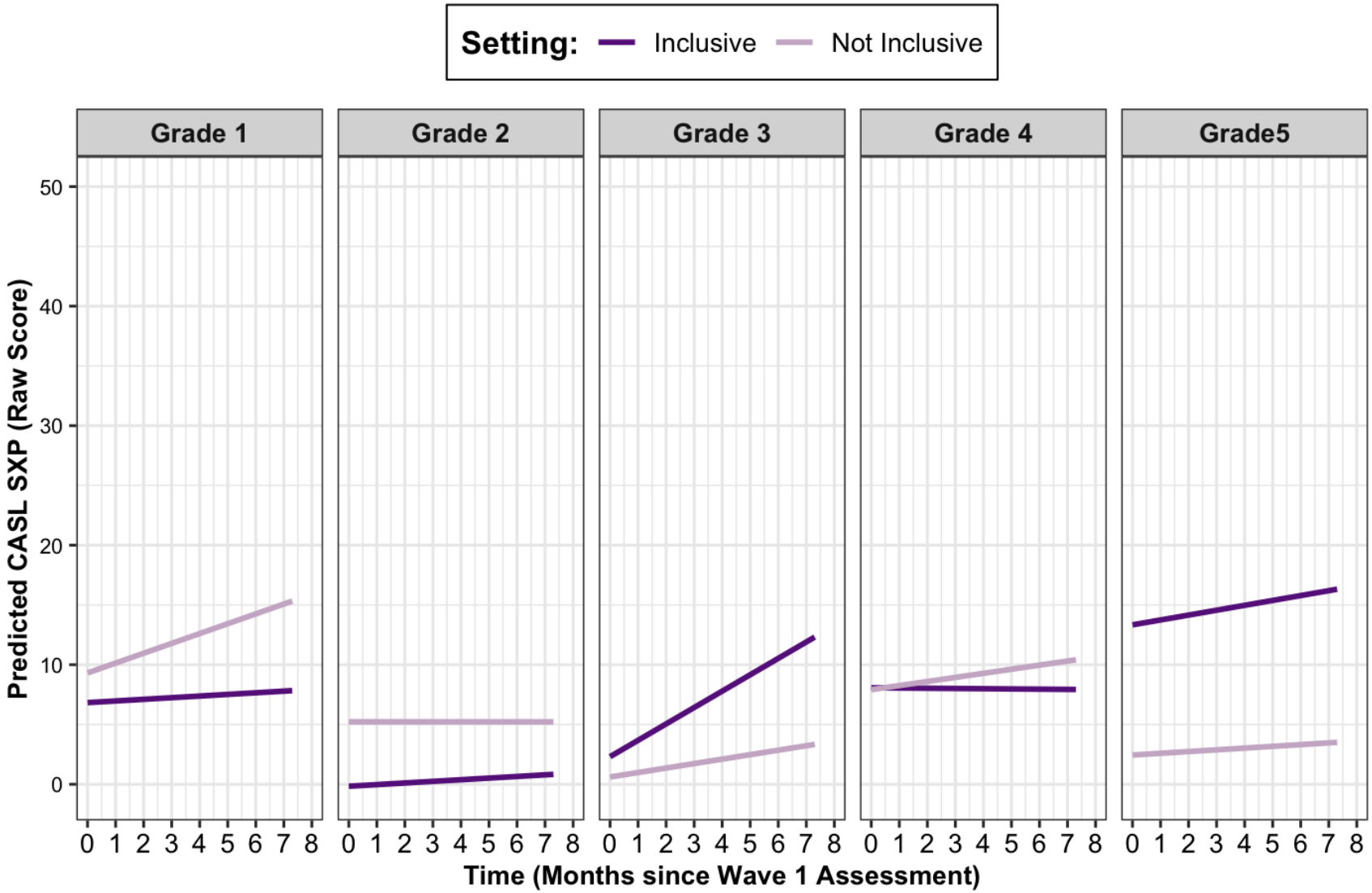
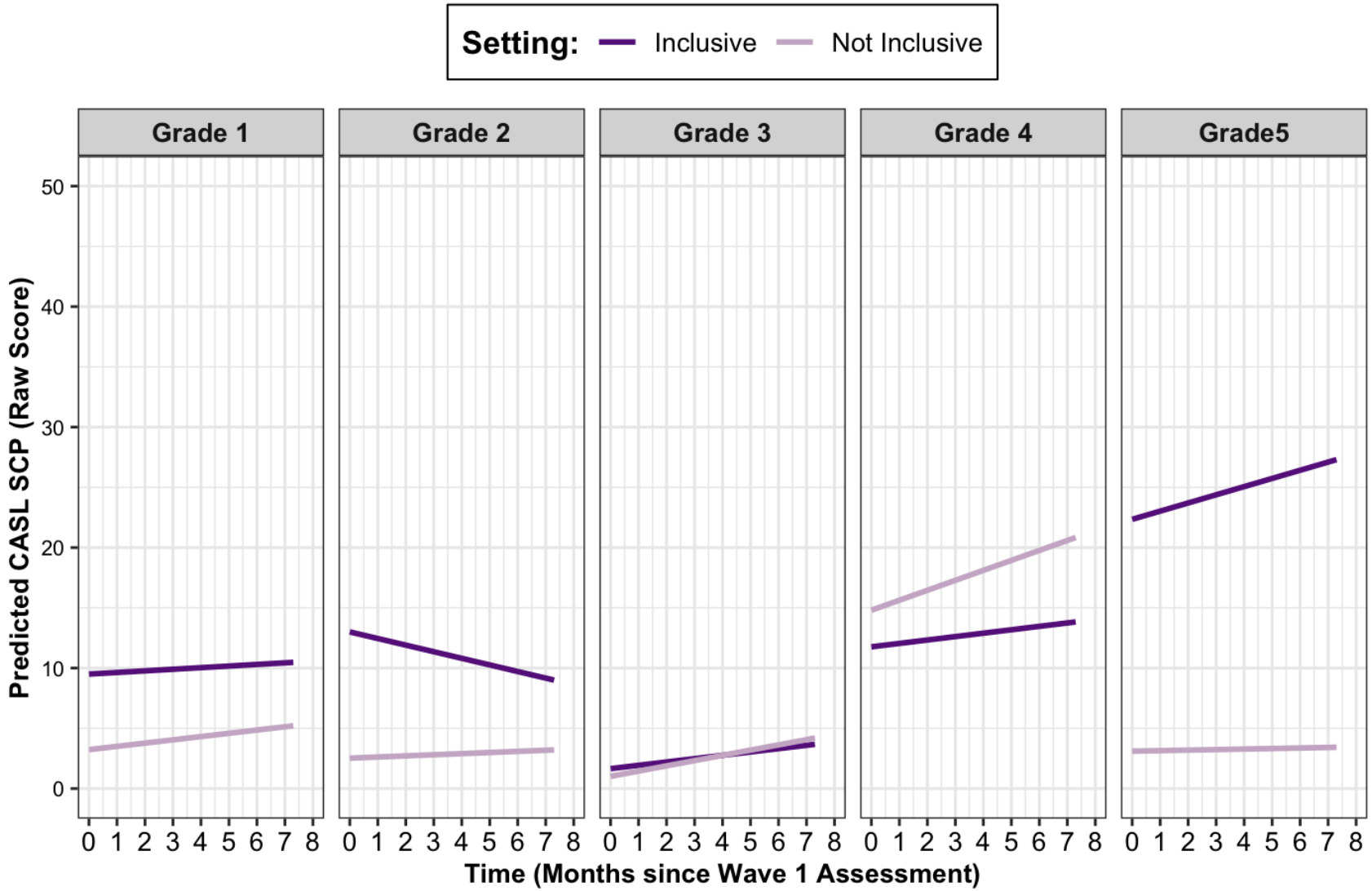


Figure 4.14

A Comparison of Predicted Mean Growth in Listening Comprehension by Placements and Grade Level



CHAPTER FIVE: Discussion

This study investigated 1) the characteristics of teachers' literacy beliefs and instructional practices for elementary students with intellectual and developmental disabilities (IDD), 2) the trajectories of literacy and language outcomes for students with IDD in grades 1 – 5, and 3) the linkages between inclusive educational placement contexts and growth trajectory parameters for students in this sample. Prior literature has documented that students with IDD are often denied opportunities to participate in effective and meaningful literacy instruction (Keefe & Copeland, 2011; Toews & Kurth, 2019), which has resulted in lower rates of literacy achievement for students with IDD (Afacan & Wilkerson, 2022; Wei et al., 2011; 2015). Observational studies have shown that elementary-aged students with extensive support needs (ESN) in segregated settings are less likely to receive instruction that is high-quality, engaging, and aligned to grade level standards (Lindstrom & Lemons, 2021; Zagona et al., 2022). While there is a large body of evidence connecting teacher beliefs and practices (Fang, 1991) and documenting the influence of teacher beliefs on literacy instruction (Ruppar et al., 2015; Roberts et al., 2024), this study sought to fill a gap in the extant literature connecting differences in teacher practices and inclusive educational contexts to student achievement.

In recent works, scholars have called for further research to examine the effects of inclusive placements on academic outcomes for learners with ESN (Jackson et al., 2022; Kurth et al., 2025, Zagona et al., 2022). Using multilevel linear modeling, this study estimated mean longitudinal growth trajectories for early literacy outcomes for elementary-aged students with IDD and tested the extent to which inclusive placements were predictive of growth parameters. Specifically, six key areas of literacy and language development were examined: (a) word recognition, (b) decoding, (c) reading comprehension, (d) vocabulary, (e) expression, and (f)

listening comprehension were each measured using standardized assessments. Table 5.1 provides a brief summary of the significance of fixed effect predictors across each of the six variables of interest grouped by category, including linear growth or time, grade level, inclusive placements and combinations of interactions. This study contributes new evidence to enhance our understanding of the effects of educational placement contexts on the growth and development of literacy and language skills for students with IDD over time.

Table 5.1

Summary of Significant Fixed Effect Predictors Identified Across Variables of Interest

Variable of Interest	Categories of Predictors						
	Time	*Grade*	*Time by Grade*	*Inclusive Placement*	*Grade by Placement*	*Time by Placement*	*Cross-Level Interactions*
Literacy Outcomes							
Word Recognition		■		■	□		
Decoding	■	■			□		
Reading Comprehension	■	■	◆	■	□		□
Language Outcomes							
Vocabulary						■	
Expression					■		
Listening Comprehension				■	■		

Note. N = 31 students represented in the full model (M3). Symbols indicate at least one significant fixed effect predictor of a minimum significance value of $p < 0.05$, ■ = positive model coefficients, □ = negative model coefficients, and ◆ = both positive and negative coefficients were significant in the model. Literacy measures are selected subtests from the Woodcock-Johnson Tests of Achievement IV. Language measures are selected subtests of the Comprehensive Assessment of Spoken language (2 ed.)

Teachers' Beliefs and Instructional Practices in Literacy for Students with IDD

Based on the results from this study, educators in our sample held beliefs about literacy instruction that were aligned to functional frameworks of literacy for students with IDD. Special educators, in both inclusive and non-inclusive settings, endorsed more items aligned to basic skills and adult quality of life than traditional or expansive approaches to literacy, which build independence in reading texts or emphasize connection and shared meaning-making about texts.

The small subset of general educators in this sample (n = 4) endorsed items equally across functional, traditional, and expansive approaches to literacy. Prior work has documented similar prioritization of early foundational (i.e., letter names and sounds) or functional literacy skills in special educators who provide literacy instruction to students with ESN (Kurth, Tucker, et al., 2025; Zagona et al., 2024). Instructional emphasis on functional literacy learning has been associated with diminished expectations for students with ESN (Kliewer et al., 2006; Ruppar et al., 2011). These are often expressed in educators' beliefs about students' competence (Krishnan, 2021) and capacity for literacy learning (Ruppar et al., 2015).

As captured by this survey, special educators' approaches to literacy instruction are focused on adult life skills and grounded in a sense of educational urgency (Ayres et al., 2011), meaning that instruction should focus on preparing students for adult life from a young age. Special educators also endorsed beliefs that deviate away from traditional approaches to literacy instruction that are often cited as best practices for building independence as a reader for students with IDD such as systematic phonics or multicomponent literacy instruction (Afacan et al., 2018; Browder et al., 2006; Dessemontet et al., 2019). Educational urgency stems from dysconscious acts of ableism (Broderick & Lalvani, 2017) with teachers assuming that children with IDD are incapable of responding to traditional methods for literacy instruction and in need of an intense focus on adult independence from a young age. This is also related to the adultification of young learners with ESN (Roberts, Wilhelm, et al., 2024).

Adultification bias describes a manifestation of structural racism in which youth of Color, especially Black girls (Morris, 2019), are perceived as older than their chronological age. In response, children are held to developmentally inappropriate expectations or viewed as less in need of nurturing and care. For students with ESN the adultification bias manifests differently,

but in an analogous way, as it stems from ableist oppression. From an early age, students with ESN are viewed less entitled to age-appropriate emotions, behaviors, or instruction because of a focus on adult independence (Bannerman et al., 1990). Compliance and high-control practices are a frequent focus of intervention for students with ESN (for reviews see Malone & Zimmerman, 2023; Veverka et al., 2025) Although the field has evolved to incorporate more self-determination practices for individuals with ESN, there is still limited research exploring self-determination for young learners or as it applies to literacy learning (Alsaeed et al., 2023). The related effects of this adultification bias are still evident in literacy instruction. Students are provided with instruction that inappropriately focuses on adult independence, because due to their disability, they are presumed incompetent in relation to their same-aged peers. During interviews connected to the larger mixed-method sample of this study, one elementary school teacher described how functional literacy was critical for her students to prepare them to "just get through life" with skills to "read a bus map" or locate "where the butter is at the store" (Roberts, Wilhelm, et al., 2024). Despite working with elementary-aged students, adultification bias leads educators to focus narrowly on the prioritization of "life skills" (Ruppar et al., 2011) at the expense of effective literacy instruction which denies students the opportunities to develop foundational skills for independent reading.

When asked to report on how frequently they addressed certain literacy content areas, special educators reported a frequent focus on code-based skill development (i.e., phonics and decodable readers), whereas general educations reported a more frequent focus on meaning-based literacy (i.e., responding to questions about texts and discussing meaning). Special educators in this sample also reported a high frequency of addressing literacy content areas in patterns that contrasted their self-reported beliefs about literacy instruction. For example, only

one special educator endorsed the item *"Literacy instruction teaches you to comprehend, read, and apply new information"* (Belief #5), but 60% of special educators reported addressing listening comprehension three or more times a week. These reported differences help us begin to hypothesize how instruction may have varied across placements in this sample, but inconsistencies between endorsed beliefs, reported instruction, and prior observations (Roberts, Hudson, et al., 2024) limited my interpretation of these findings.

In an observational study, Lindstrom and Lemons (2021) documented that teacher reports of instructional focus differed from time sampled data. Teachers in their sample overestimated the amount of instructional time spent on literacy content. Early analysis of observational data from the larger mixed-method study associated with this inquiry suggests that similar reporting bias may have occurred in this sample. When indicating how frequently they addressed content during instruction, teachers may have inflated their reports given that a few of the same teachers in this sample were observed engaging in limited academic instruction (Roberts, Hudson, et al., 2024). Recent work by Lindström and colleagues (2025) identified that special educators' knowledge of systematic literacy instruction was associated with higher sense of responsibility and expectations for literacy learning in students with IDD. These findings, in conjunction with my own, raise new questions about how special educators' functional beliefs about the purpose of literacy instruction for students with IDD, may shape their perceptions of their own instructional quality, effectiveness, and responsibility.

Teacher reports of instructional groupings and support were consistent with other studies in the extant literature. General educators reported frequent use of whole group learning, peer-supported learning, and independent work activities, which is comparable to recent ecobehavioral observations of inclusive literacy instruction for students with ESN (Zagona et al.,

2022). Most special educators in this survey reported daily use of small group (80% of respondents), paraprofessional-led (73% of respondents), and individual instruction (63% of respondents) during literacy learning. These findings replicate similar evidence from time sampling studies in segregated elementary classrooms (Kurth, Turner, et al., 2025), and video observations of literacy instruction for students with IDD (Lindström & Lemons, 2021). The consistent use of instructional grouping and strategies reported by teachers in this sample and across similar studies of elementary-aged students with IDD presents a pattern across literacy learning contexts in non-inclusive settings. For many elementary-aged students with IDD in special education settings, literacy learning opportunities are limited (Kurth, Turner, et al., 2025; Lindström & Lemons, 2021; Roberts et al., 2024), tend to focus on isolated, early literacy skills (Kurth, Turner, et al., 2025), are primarily provided through individualized instruction (Kurth, Turner, et al., 2025), and furthermore, do not use high-quality instructional practices (Lindström & Lemons, 2021) or align to grade level standards (Zagona et al., 2024). Functional frameworks of literacy have direct implications for the content and quality of the literacy instruction provided to students with IDD, and in correspondingly, the application of these frameworks shape their literacy development over time.

Literacy and Language Growth Trajectories

For students in this study, the final model (M3) estimated a positive rate of growth over time for each of the six outcomes examined, but the only significant rates of growth were found for decoding (WA) and reading comprehension (PC) measures (see Table 4.6-4.7). The mean growth trajectories over a full academic year show improved scores over time, with annual mean growth rate ranging from 1.75 – 3.50 points per year. For the language variables measured by the CASL-2 in this study, the average expected gain across an academic year for students in grades

1-5 in receptive vocabulary, sentence expression, and listening comprehension measures were reported as 1.50, 1.40, and 1.50 points based on grade level equivalents reported from standardization samples (Table A.6, p. 335, Carrow-Woolfolk, 2017). With the exception of students in Grade 2, the mean growth trajectories for students in this sample showed improvement in all variables of interest. Interestingly, the mean trajectory for students in Grade 3 indicated a higher rate of growth compared to the overall mean for all measures, except listening comprehension. The results indicate that on average in this sample demonstrated measurable growth in traditional, standardized measures of literacy skills over the course of one year.

While students in this sample did demonstrate growth over time, their overall level of performance (as measured by mean intercept at Wave 1, see Tables 4.5-4.10) was below grade level expectations. These findings are consistent with earlier works that suggest students with ESN respond positively to effective instruction but often begin at a lower level of skill development (Allor et al., 2014; Hunt et al., 2020; Lemons et al., 2017). Moreover, although students demonstrated growth in raw scores of decoding, only students in Grade 4 were predicted to score in the range of applied decoding (see Figure 4.4). The overall sample mean and predicted means for Grades 1, 2, 3, and 5 were below a raw score of 10. For the WA decoding measure, early items include letter-sound correspondence and single sound matching. To earn a raw score over 10, students are required to accurately decode and restate one syllable nonsense words. These findings may imply that while students with IDD are given the opportunity to master foundational skills for letter sound correspondence, they are not provided with adequate instruction to develop applied skills for decoding new words.

Additional evidence from mean growth trajectories supported the claim that growth rates for students with IDD are connected to the content addressed in literacy instruction. As observed

in the predicted growth trajectories of individual students (see Figure 4.1), students' performance on decoding, reading comprehension, expression, and listening comprehension clustered consistently in the low range for raw score (0-10 points). However, student scores for word recognition and receptive vocabulary showed more variability in both initial scores and the highest rates of growth among variables of interest (see Table 4.5 and 4.8). One possible explanation for this difference is the documented focus on individual word reading (i.e., sight or high frequency words) and vocabulary instruction for learners with IDD (Browder & Xin, 1998; Browder et al., 2006; Hunt et al., 2022; Roberts et al., 2013). Students may have received more instruction in each of these skills, whereas prior research has found evidence that instruction in systematic instruction in decoding or applied comprehension may be less likely to occur (Kurth, Tucker, et al., 2025; Lindström & Lemons, 2021). Collectively, these findings are interpreted as evidence that student achievement outcomes are directly influenced by the instructional focus of the literacy instruction that is made available to them. Stated plainly, elementary-aged students with IDD showed the highest rates of growth in individual word recognition and vocabulary because that is where they were most likely to receive focused instruction. As demonstrated in my earlier findings, teacher beliefs about functional literacy mediate student opportunities for literacy learning and demonstrate differential effects in student achievement across literacy content areas. Without viewing students as capable of achieving more complex literacy skills, such as decoding or comprehension, instruction is withheld in those areas and deficit narratives about learning expectations are confirmed as self-fulfilling prophecies (Kliewer et al., 2006).

Context Effects of Inclusive Educational Placements

Prior research in the field has identified how educator beliefs shape cognition (Fang, 1996), curricular philosophies, and instructional decision making in literacy learning (Ruppar et

al., 2011;2015). This inquiry sought to extend that work by observing how these effects are represented within the context effects of inclusive educational placements on achievement for students with IDD. The full model presented in this study examined the predictive effects of inclusive placements as well as its interactions with time and grade level factors on students' literacy development. Inclusive placements were defined as students accessing educational Placements A & B (> 40% of the day in general education), and non-inclusive placements were defined as students accessing services in Placements C & D (< 40% of the day in general education). Based on my model, the context effect of inclusive placements was a significant predictor of student achievement outcomes for all six variables of interest (see Table 5.1).

On average, students with ESN in inclusive settings were observed to have higher starting scores and maintained positive rates of growth across the academic year (with the exception of Grade 2 SCP and Grade 4 SXP outcomes). In contrast, negative rates of growth were observed in some grade levels for students accessing non-inclusive placements in word recognition (see Figure 4.9), decoding (see Figure 4.10), reading comprehension (see Figure 4.11), and receptive vocabulary (see Figure 4.12). In addition to within grade level progress, average predicted growth values for word recognition, reading comprehension, and receptive vocabulary demonstrated incremental improvements across the elementary years, from grade 1 to grade 5, for students with ESN accessing inclusive placements. With this sample of students, a significant positive interaction effect for time and placement was only directly observed in receptive vocabulary outcomes (see Table 4.8). However, a cross-comparison of the average predicted values offer some evidence that access to inclusive placements may provide benefits to students over time. Prior research evaluating student growth through IEP document analysis has shown that students with ESN who access inclusive placements are more likely to show academic

progress in comparison to peers with ESN who are in non-inclusive placements (Gee et al., 2020; Kurth & Mastergeorge, 2010). This study is unique in that it employs direct measures of student achievement aligned to literacy skill performance to demonstrate the benefits of inclusive placements, rather than interpretation of secondary data (see Mansouri et al., 2022).

Differences in student achievement by placement may be connected to both the effects of instruction and proximal process factors (Bronfenbrenner, 1994). Jackson and colleagues (2022) reported that students in inclusive classrooms (Placements A & B) were more likely to access academic instruction and materials aligned to grade level curriculum. A small observational study documented that students with ESN in inclusive literacy lessons participate successfully in grade level literacy activities, with a small percentage of activities requiring modification (Zagona et al., 2021). The differences of inclusive placements identified in the literacy variables of interest, word recognition, decoding, and reading comprehension, may be associated with instructional quality and materials as these skill areas are likely to improve with high-quality instruction (Moats, 2020; Spear-Swerling, 2022). Bronfenbrenner's concept of proximal process may account for the influence of peers and interactions within the inclusive environment as contributors to growth in language acquisition (Bronfenbrenner, 1994). Peer interactions as a key feature of inclusive educational contexts (Jackson et al., 2008) and social outcomes are frequently cited as benefits for inclusive placements of students with ESN (Mansouri et al., 2022). In contrast to the literacy variables of interest in this study, language variables did not demonstrate significant effects by grade level, but did identify significant interaction effects with placement. Students accessing non-inclusive placements, without access to peer models, showed decreases in receptive vocabulary, and only minimal growth in expression and listening comprehension variables. In contrast, students accessing inclusive placements displayed higher

initial scores on average, and significant differences in listening comprehension scores for students in Grade 5 (see Table 4.10 and Figure 4.14). Extant literature has reported that access to inclusion is associated with gains in social skills, self-determination, and post-secondary outcomes (Mansouri et al., 2022; Taylor et al., 2020; Wehmeyer et al., 2021). While the unique predictive value of inclusive placements varied, my results present a within-sample replication of the effects of inclusive placement as a statistically significant factor in student achievement scores for this sample of students. Across the six variables of interest modeled in this analysis, this study provides evidence that inclusive placements had a positive effect on the literacy and language achievement outcomes of students in this study, and supports the hypothesis that educational context in addition to instruction are important factors in literacy learning for students with ESN.

Intensive Intervention Versus Inclusive Instruction

As many students with ESN continued to be served in segregated classroom spaces (Brock et al., 2018; Kurth et al., 2014; Morningstar et al., 2017), many scholars in inclusive education have called for research measuring the effects of inclusive placements on student academic achievement (Kurth, Hicks, et al., 2025; Kurth, Turner, et al., 2025; Zagona et al., 2022). At the same time, other scholars have reasserted the value of special education as a mechanism for providing intensive intervention irrespective of educational placements (Fuchs et al., 2025; Kaufman et al., 2020). Fuchs and colleagues (2025) position the argument as a conflict between *where* to teach and *how* to teach students with disabilities, including those with various eligibility labels. In contrast to that argument, this exploration into the effects of inclusive placements for students with ESN, along with the work of others (Giangreco, 2020; Kurth, Tucker, et al., 2025; Ruppar et al., 2011; Zagona et al., 2024), posits that for students with ESN

what and *how* students are taught literacy skills is most often inextricably linked to *where.* Extending upon the work of Jackson and colleagues (2008), this analysis of the context effects of inclusive placements on literacy learning for students with IDD raises questions about practical implementation of intensive instruction and its implications for student achievement.

The need for specially designed, intensive instruction is often referenced as a key argument in support of segregated placements for students with ESN (Fuchs et al., 2025; Kaufman et al., 2020). By design these placements are described as providing "intensity, specialization, and effectiveness" (p. 3; Fuchs et al., 2025) through "systematic and explicit instruction" with "very high opportunities to respond" (p. 29, Kaufman et al., 2020). These methods are also supported by the wealth of extant literature documenting effective literacy interventions for students with IDD (for reviews see Alquiraini & Rao, 2019; Dessemontet et al. 2019; 2024). Given these assumptions, one would assume a null or negative effect for inclusive placements in the final model for literacy outcomes. In this case, no difference would be observed across student placement groups, or students in non-inclusive placements who received intensive instruction would outpace the growth of the students in inclusive placements. While this was observed in some cases (Grade 3 LWID, SCP, and Grade 4 SCP), the effects were not consistent and only accounted for 3 of 30 grade level by placement trajectories. I acknowledge that these results do not uniformly demonstrate the benefits of inclusive literacy education, but likewise, they do not support claims that literacy instruction provided in the non-inclusive settings was more effective in this sample.

As the debate between intensive instruction and inclusive placements continues within the field of special education (Fuchs et al., 2025; Wehmeyer et al; 2021), this study offers new insight into the effects of inclusive placements on achievement outcomes for students with ESN.

Based on the survey results, findings suggest that *how* special educators in this study delivered literacy instruction is aligned to functional frameworks for literacy instruction. This is congruent with the findings of previous studies that documented literacy instruction in a narrow range of skills for students with IDD (Kurth, Tucker, et al., 2025; Ruppar et al., 2011; 2018; Roberts, Hudson, et al., 2024). As observed in my repeated measures data, predicted individual student and mean grade level trajectories demonstrated higher rates of growth in the areas of individual word reading (LWID) and vocabulary (RV). These findings support the claims of prior qualitative and observational studies documenting *what* content students with IDD are most likely to encounter in routine instruction in special education classrooms (Alghrim-Delzell & Rivera, 2015; Lindström & Lemons, 2021). Lastly, the observed positive effects of inclusive placements on literacy achievement in this study illustrate the importance of *where* students with IDD participate in literacy instruction, as it has been shown to influence the quality of literacy instruction (Lindstrom & Lemons, 2021; Ruppar et al., 2018; Zagona et al., 2024), appropriateness of materials and curriculum (Hunt et al., 2022; Jackson et al., 2022; Kurth, Tucker et al., 2025; Ruppar et al., 2011), and opportunities for engagement (Kurth, Hicks, et al., 2025; Zagona et al., 2021; 2022). While this study does not make any inferential claims about the link between instruction and achievement, the results from my growth models show that, on average, elementary-aged students with IDD in this sample were able to demonstrate growth in key literacy variables over the course of one academic year; *and* students with access to inclusive placements demonstrated higher predicted scores and rates of growth in all six literacy outcomes.

Limitations

Several limitations have been identified in this study, including sample size, assessment selection, and limited inference capabilities of self-report surveys. The primary limitation of this

study is that it is correlational in nature, so no causal conclusions can be drawn. For example, it cannot be known from this study whether students were placed into more inclusive classrooms in the fall due to higher literacy and language skills, or if students who have received more inclusive instruction throughout their education have benefited in the form of having higher outcomes. A similar caveat applies to the difference in growth rates for reading comprehension. Future work should take this up by following students longitudinally over a number of years, rather than one academic year.

The second limitation of this work is the small total sample included in the model (N = 31). As noted in Chapter 3, one student was omitted because placement information could not be confirmed. Additionally, the uneven distribution of students across educational placements (see Table 3.3) limited my ability to estimate the specific growth parameters associated with specific placement categories. Small sample sizes increase standard errors, limit the number of estimable model parameters, and limit the power to detect significant effects among participants (Snijders & Bosker, 2012). However, as Smith and Little (2018) demonstrated, small-*n* designs hold strong inferential validity when paired with reliable data collection methods and strong theoretical framings. This study was further limited by the number of data collection points available for analysis such that any polynomial growth patterns were not able to be modeled. Future research can address these issues.

The third limitation acknowledged in this work is that the achievement measures selected for this study lacked the sensitivity to detect smaller incremental growth over one academic year. While standardized measures are acceptable for intermittent measurement at this interval, more frequent administrations of assessments, a larger number of low difficulty items, or the use of accommodations to testing may have been better able to detect growth in this sample of students

(Sireci, 2020). This may have expanded the range of raw scores for growth modeling and decreased any individual floor effects demonstrated by participants in this sample.

The fourth limitation stems from the nature of instructional data collected via survey in this study. Of the students included in this sample, teacher survey responses were only captured for 77% of students (6 teachers of 7 students did not respond to survey measures). As a result, I had limited data to characterize the type or content of literacy instruction available to those students in their respective settings. Therefore, findings based on teacher surveys should be interpreted with attention to this reduced sample and as separate from the predicted student growth modeling. While the survey responses offer helpful insight into teacher perception and beliefs, self-report measures in this sample may have been influenced by social desirability bias (DeVellis, 2017; Kurmpal, 2011). Teachers tended to report high levels and frequency of literacy instruction that are incongruous from the rates of growth observed in this sample. Social desirability bias may lead teachers to rate themselves more favorably or report engaging in instructional behaviors more frequently than they occurred. Prior research in this field has documented inconsistencies between teacher self-reported activities and instructional observations (Lindstrom & Lemons, 2021). However, without direct observations of teacher behaviors, I was not able to confirm the frequency, intensity, or quality of literacy instruction received by students in both inclusive and non-inclusive placements. Additional information about the amount, type, and quality of literacy instruction for these students, collected through time sampling, video footage, sample instructional materials, or repeated direct observation, may have supported larger claims about the differences between placements and student outcomes.

Future Directions

Further exploration into inclusive literacy instruction for elementary-aged students with IDD should continue to investigate outcome oriented evidence in support of inclusive literacy instruction. Future studies may involve quasi-experimental designs employing matched sample designs across schools or longitudinal measurements of student progress over several years . Since educational placement cannot be randomly assigned, future studies should consider strategies for recruitment and design that ensure adequate power to detect and measure student progress. This will allow researchers to begin to tease apart the influence of instruction from placement, or conversely, identify the synergistic effects of instruction and inclusive placements across elementary years.

In addition to documenting student growth across placements, additional research may want to consider the influence of other frameworks for literacy instruction, such as multiliteracies or expansive approaches in the classroom. Selected works have captured the ways in which expansive approaches to literacy increase student engagement (Kleekamp, 2021), shift educator assumptions (Krishnan, 2021) and can be a resource for building connection and community with children with ESN (Roberts et al., 2025). Observational and mixed-methods designs may provide insight into what type of literacy learning meaningfully engages students and allows them to demonstrate progress in individual and authentic ways. Complementary research may also examine how expansive literacy activities contribute to the development of traditional literacy skills, which can serve as the foundation for engaging in multimodal texts, artistic and oral storytelling, or shared mean making for students with ESN (Roberts et al., 2025).

Future research into inclusive literacy instruction for students with ESN, must also acknowledge the tensions existing between ableism, deficit narratives, and the "literate invisibility" (Kliewer et al., 2006) experienced by many students with ESN in schools. In order to shift presumptions of competence and build inclusive learning communities, teacher preparation programs must equip future teachers with the preparedness to serve as inclusive educators (Giangreco, 2020) and the knowledge to provide effective and meaningful literacy instruction to students with ESN (Lindström et al., 2025). Changing the state of teacher beliefs about student ability and the importance of literacy instruction for students with ESN will empower educators to see their students' capabilities and envision new and inclusive spaces for literacy learning.

Conclusion

In summary, this work examined teacher beliefs about literacy instruction for elementary-aged students with IDD and explored significant predictors of student achievement in six literacy variables of interest: word recognition, decoding, reading comprehension, vocabulary, expression, and listening comprehension. Multilevel linear modeling was used to analyze the mean growth trajectories for students ($N = 31$) in grades 1 – 5 with IDD and estimate the context effects of inclusive placements on student outcomes. Results indicated that students with ESN demonstrated higher rates of progress in word recognition (i.e., individual word reading) and vocabulary, which are often identified as frequent focus of instruction for young learners with ESN (Ahlgrim-Delzell & Rivera, 2015; Hunt et al., 2022). In all included outcomes, inclusive placements were determined to have a significant effect on student growth as a fixed effect or in interaction with grade level and time predictors. The implications of these results serve to challenge the assumption that students with ESN receive more benefit from intensive instruction

that is provided in segregated classrooms. In turn, these findings invite further inquiry into the specific mechanisms that influence student outcomes in inclusive learning environments and support the acquisition of literacy skills for young students with ESN.

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COLLEGE OF EDUCATION
UNIVERSITY of WASHINGTON

Literacy Instruction Survey

UW Reading Development Project Teacher Instruction Survey

Thank you for supporting the **UW Reading Development Project**! We are asking you to participate in this survey because you have at least one student in your classroom who is participating in our study. We want to be able to describe the literacy instruction of all participating students' classrooms. Since 2024 Spring assessments are the final sessions for this project, we are asking you to complete this survey again.

This survey takes about **5-10 minutes**, and those we complete the survey will **receive a $50 gift card** via email. Participation is voluntary and you can discontinue at any time. All responses are confidential and only

accessible to the UW College of Education research team. If you have any questions about this survey or the research project, please contact us at readingdevproject@uw.edu or visit our website at UW Reading Development Project . Thank you in advance for your help!

Please indicate if you consent to participate in this survey:

- ○ Yes, I want to participate!
- ○ No, I do not currently want to participate.
- ○ Maybe, but I need more information. Please email me here:

This academic year (2023-24), for which grade levels are you teaching literacy and language instruction? Select all that apply.

- ☐ Kindergarten
- ☐ First Grade
- ☐ Second Grade
- ☐ Third Grade
- ☐ Fourth Grade

- [ ] Fifth Grade
- [ ] Other

How many years of teaching experience do you have?

What is your gender identity?

- ○ Female
- ○ Male
- ○ Non-Binary
- ○ Prefer not to say

What is your race or ethnicity? Check all that apply.

- [ ] African American
- [ ] American Indian, Native American, or Native Alaskan
- [ ] Asian
- [ ] Hispanic or Latinx
- [ ] Pacific Islander
- [ ] White
- [ ] Prefer not to say

☐ [ ] Other

Which of the following best describes your classroom setting?

- ○ I teach self-contained Special Education. Most of my students spend 80-100% of their day in settings with other students who have IEPs and do not participate in academic or social settings with grade-level peers.
- ○ I teach self-contained Special Education with Inclusive Services. Most of my students spend 60-80% of their day in my classroom and participate in academics and social settings with grade-level peers.
- ○ I teach resource or intervention. Most of my students spend at least half of their day in general education and receive some pull-out instruction in a special education classroom.
- ○ I teach general education. Most of my students do not have IEPs, and students with IEPs receive inclusive special education services in my grade-level classroom.
- ○ [ ] Other Educational Setting:

Please think about your classroom literacy and language instruction last week. How often did you teach these content areas as part of your lessons?

	Not at all (1)	(2)	(3)	(4)	Daily (5)

Phonological Awareness *For example: rhyming activities, first-sounds, splitting or combining words into sounds*	○	○	○	○	○
Phonics *For example: Letter recognition, letter sound practice, decodable words, word families*	○	○	○	○	○
Reading Texts *For example: decodable readers, illustrated picture books, textbooks, written communication like letters, texts, or emails*	○	○	○	○	○
Fluency *For example: timed word or letter sound reading, timed passages, repeated practice*	○	○	○	○	○
Handwriting *For example: Lines and shapes, letter strokes, letter formation, name writing*	○	○	○	○	○
Writing Composition *For example: composing sentences, writing sentences, creating paragraphs or texts*	○	○	○	○	○

Please think about your classroom literacy and language instruction last week. How often did you teach these content areas as part of your lessons?

	Not at all (1)	(2)	(3)	(4)	Daily (5)
Vocabulary *For example: identifying words in context, word to picture matching, word meanings, applying words in context*	○	○	○	○	○
Reading Comprehension *For example: discussing meaning after reading a text, responding to questions after reading a passage, completing sentences using meaning from a text*	○	○	○	○	○
Listening Comprehension *For example: discussing meaning after a read aloud or video, responding to questions after listening, applying information to new situations*	○	○	○	○	○
Oral Language and Communication *For example: word identification, speech production, social language and exchanges, storytelling and dialouge, developing background knowledge*	○	○	○	○	○
Other Instruction? *Please include any other content areas in your language and literacy instruction that are not listed here.*	○	○	○	○	○

Please think about your classroom literacy and language instruction last week. How often did you teach with these types of groupings and supports?

	Not at all (1)	(2)	(3)	(4)	Daily (5)
Whole Group Instruction *Defined as: All students and teachers learning the same content together*	○	○	○	○	○
Small Group Instruction *Defined as: 2-6 students working closely with the teacher after whole group lessons or to receive individualized instruction and feedback.*	○	○	○	○	○
Individual Instruction *Defined as: one student and one teacher working on individualized learning objectives and specific content apart from other students in the class.*	○	○	○	○	○
Paraprofessional Led instruction *Defined as: Whole, small, or individualized lesson content delivered by instructional assistants*	○	○	○	○	○
Other Instruction? *Please add any other instructional groupings or supports that you used within the last week, but are not listed here.*	○	○	○	○	○

Please think about your classroom literacy and language instruction last week. How often did you teach with these types of groupings and supports?

	Not at all (1)	(2)	(3)	(4)	Daily (5)

Assistive Technology
For example: augmentative or alternative communication devices, voice to text, screen readers, switch activation, Braille, adapted computers or tablets

Instructional Technology
For example: Smart boards, touch screen devices, online modules, virtual classrooms, interactive videos

Peer Supported Learning
Defined as: two or more students working cooperatively on lesson activities, collaborating on projects, discussing lesson topics, or engaged in peer to peer tutoring.

Independent Learning
Defined as: one student working individually on prepared tasks or activities

Other Instruction?
Please add any other instructional groupings or supports that you used within the last week, but are not listed here.

Read the list of statements below. Then select the **3 statements that best describe** your answer to the following question:

In your opinion, what is the goal of literacy instruction?

- ☐ Literacy instruction is important to enjoy reading and listening to texts.
- ☐ Literacy learning allows you to communicate your ideas with others.

- [ ] Literacy instruction supports functioning in adult life.
- [ ] Literacy instruction supports progress through grade-level standards.
- [ ] Literacy instruction improves independence, adaptive skills, and quality of life.
- [ ] Literacy instruction is critical for basic safety skills and navigating environments.
- [ ] Literacy instruction is a tool for unlocking other learning.
- [ ] Literacy instruction teaches you to comprehend, read, and apply information.
- [ ] Literacy instruction helps you access and make connections across texts.

Is there anything else you would like to tell us about your literacy and language instruction?