

INVESTIGATING THE “GIFT OF TIME”: PREDICTORS AND OUTCOMES
ASSOCIATED WITH DELAYED SCHOOL ENTRY AND KINDERGARTEN
RETENTION

by

Jordan E. Greenburg
A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
Psychology

Committee:

_____ Director

_____ Department Chairperson

_____ Program Director

_____ Dean, College of Humanities
and Social Sciences

Date: _____ Spring Semester 2021
George Mason University
Fairfax, VA

Investigating the “Gift of Time”: Predictors and Outcomes Associated with Delayed
School Entry and Kindergarten Retention

A Dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at George Mason University

by

Jordan E. Greenburg
Master of Arts
George Mason University, 2019

Director: Adam Winsler, Professor
Department of Psychology

Spring Semester 2021
George Mason University
Fairfax, VA

Copyright 2018 Jordan E. Greenburg
All Rights Reserved

DEDICATION

I would like to dedicate this dissertation to my family, who has been my constant source of support throughout my academic career. In particular, I would like to dedicate this to my mom. Sitting in your classroom is what sparked my love of education.

ACKNOWLEDGEMENTS

I would like to thank all of those who have walked (or swum or biked or run) with me throughout my education. First, my family, who has provided endless love and support despite being hundreds of miles away. You all have given me the strongest foundation and more encouragement than I could have possibly asked for. Courtney and Alena, who have both been unwavering sources of joy throughout my graduate career. My Emory soul village, who has always helped me find home no matter where we are. Dr. Winsler, who has provided me with so much support for this research. Finally, Drs. Curby, Goldstein, and Jenkins; this dissertation would not have been possible without them.

TABLE OF CONTENTS

	Page
List of Tables	ix
List of Figures	x
List of Appendix Tables.....	xi
Abstract	xii
Investigating the “Gift of Time:” Predictors and outcomes associated with delayed school entry and kindergarten retention	1
Prevalence and Trends	3
Delayed Entry	3
Kindergarten Retention	4
Changes in School Entry Age	5
Theoretical Frameworks.....	5
Maturationist Theory	5
Social Comparison: Frames of Reference and Self-Concept	7
Timing	9
Selection into Delayed Entry and Kindergarten Retention	9
Delayed Entry	10
Kindergarten Retention.....	12
Outcomes Associated with Delayed Entry and Retention	13
Comparison Groups: Same-Age vs. Same-Grade	13
Delayed Entry	14
Early Grade Retention	16
Similarities between Delayed Entry and Retention Outcomes.....	19
Delayed Entry and Retention Together	20
Individual Differences: Children with Disabilities	21
The Current Study	24
Research Questions and Hypotheses	26

Method	29
Participants	29
Measures	31
Kindergarten Progressions	31
Delayed Entry.	31
Retained.	31
On-Time/Typically Progressing.....	31
Demographics/Covariates	31
Gender.....	31
Ethnicity.....	32
FRL Status.	32
ELL status.	33
Relative age.....	33
Childcare arrangement.	33
Special education status.	34
School ID.	35
Learning Accomplishment Profile—Diagnostic (LAP-D).	35
Devereux Early Childhood Assessment (DECA).	36
Achievement Variables	37
Kindergarten Performance/GPA.....	37
Standardized Math/Reading.....	37
Later Grade Retention.....	38
Analytic Plan	39
RQ1: How do children who delay entry or are retained in kindergarten differ on demographics and school readiness skills compared to each other and to children who enter school on-time?	39
RQ2: Do children who delay entry or are retained in kindergarten perform differently compared to each other and to typically progressing students after accounting for selection effects?.....	39
RQ3: What proportion of delayed-entry, kindergarten-retained, and typically progressing students receive special education services in elementary school? When do students in each progression category first receive disability services from the schools?	40

RQ4: Do academic outcomes following altered kindergarten progressions differ for students who receive special education services?	41
Attrition.....	41
Missing Data	42
Nesting	44
Results.....	45
Selection into Kindergarten Progressions.....	45
Outcomes Associated with Different Kindergarten Progressions	47
Kindergarten	47
3 rd Grade.....	47
GPA.....	47
Standardized Reading.	48
Standardized Math.	48
Reading and Retention in 3rd Grade.....	49
5 th Grade.....	49
GPA.....	49
Standardized Reading.	50
Standardized Math.	50
1 st through 5 th Grade Retention	51
Students with Disabilities	51
Timing of Disability Identification	53
Outcomes for Students with and without Disabilities	54
Kindergarten	55
3 rd Grade.....	56
GPA.....	56
Standardized Reading.	56
Standardized Math.	57
5 th Grade.....	58
GPA.....	58
Standardized Reading.	59
Standardized Math.	59
Discussion	60
Predictors of Altered Progressions	61

Delayed Entry	61
Kindergarten Retention.....	62
Comparing Delayed-Entry Students and Kindergarten Retained Students	64
Outcomes Associated with Altered Kindergarten Progressions.....	65
Academic Achievement	65
Later Grade Retention.....	68
Considering Children with Disabilities	70
Timing of Receiving Disability Services	70
Outcomes for Children with Disabilities	72
Limitations.....	73
Future Directions	74
Implications for Practice.....	76
Tables	78
Appendix.....	91
References.....	99

LIST OF TABLES

Table 1 Sample Descriptive Statistics.....	78
Table 2 Categories of Disability Statuses (Overall Sample)	80
Table 3 Predictors of Kindergarten Progressions	81
Table 4 Predictors of Kindergarten Performance	82
Table 5 Predictors of 3rd Grade GPA, Reading, and Math	83
Table 6 Predictors of 5th Grade GPA, Reading, and Math	84
Table 7 Predictors of Later Grade Retention	85
Table 8 Disability Categories by Kindergarten Progression.....	86
Table 9 Kindergarten Performance Outcomes with Interactions between Kindergarten Progression and Disability Status	87
Table 10 3rd Grade GPA, Reading, and Math Outcomes with Interactions between Kindergarten Progression and Disability Status	88
Table 11 5th Grade GPA, Reading, and Math Outcomes with Interactions between Kindergarten Progression and Disability Status	89

LIST OF FIGURES

Figure 1 Timing of Disability Identification by Kindergarten Progression.....	90
-------------------------------------------------------------------------------	----

LIST OF APPENDIX TABLES

Appendix Table 1 Sample Attrition.....	91
Appendix Table 2 Missing Data by Child Characteristics.....	93
Appendix Table 3 3rd Grade GPA, Reading, and Math Outcomes for Children’s First Time Through 3rd Grade	95
Appendix Table 4 5th Grade GPA, Reading, and Math Outcomes for Children’s First Time Through 5th Grade	96
Appendix Table 5 3rd Grade GPA, Reading, and Math Outcomes with Interactions between Kindergarten Progression and Disability Status for Children’s First Time Through 3rd Grade.....	97
Appendix Table 6 5th Grade GPA, Reading, and Math Outcomes with Interactions between Kindergarten Progression and Disability Status for Children’s First Time Through 5th Grade.....	98

ABSTRACT

INVESTIGATING THE “GIFT OF TIME”: PREDICTORS AND OUTCOMES ASSOCIATED WITH DELAYED SCHOOL ENTRY AND KINDERGARTEN RETENTION

Jordan E. Greenburg, Ph.D.

George Mason University, 2021

Dissertation Director: Dr. Adam Winsler

With increased rigor and accountability standards in elementary school, the kindergarten curriculum has similarly become more demanding. These increased demands have augmented concerns that young children may not be able to cope with the demands of formal schooling. One way to address concerns about school readiness is by altering a child’s academic progression through delayed kindergarten entry or kindergarten retention. Both of these interventions, often referred to as the “gift of time,” are grounded in the assumption that children who are not deemed ready to start formal schooling or progress to the 1st grade will benefit from an extra year to mature or develop grade-appropriate skills. However, there is evidence that delayed entry occurs more often with children from more affluent families, whereas retention occurs more often with disadvantaged children. From an equity standpoint, it is important to understand how interventions used with different groups of children are related to later academic success.

Further, it is unclear to what extent these altered progressions are effective for children with disabilities.

The purpose of this dissertation was to explore how children who experience an altered kindergarten progression compare to each other as well as their on-time peers throughout elementary school (kindergarten, 3rd grade, and 5th grade) and whether academic outcomes following these varied progressions are moderated by disability status. These questions were answered using a large ($n = 26,207$), ethnically diverse (57% Latinx, 35% Black, 7% White/Asian/Other) sample of students derived from the Miami School Readiness Project. Multinomial regression analyses were used to compare baseline characteristics of groups of kindergartners (delayed entry, retained, on-time) prior to school entry. Results suggest that both delayed-entry and retained students were younger and had poorer school readiness skills prior to school entry compared to on-time students. Delayed-entry students were more likely to be White compared to both retained and on-time students. A series of regression analyses was conducted to explore performance throughout elementary school. Though delayed-entry and retained students performed better in kindergarten compared to typically progressing students, this advantage did not persist in 3rd and 5th grade. Although students who delayed entry or were retained in kindergarten performed more poorly than their peers later in elementary school, they were less likely to be retained in these later grades. Consistent with prior work, children who experienced altered school progressions were more likely to be identified as having a disability upon entering the school system. However, moderation analyses suggested that the outcomes associated with altering the kindergarten

progression were similar between children with and without disabilities. Overall, these results indicate that altering the kindergarten progression does not provide children with long-term achievement benefits.

Keywords: delayed entry, grade retention, kindergarten, school readiness, achievement

INVESTIGATING THE “GIFT OF TIME:” PREDICTORS AND OUTCOMES ASSOCIATED WITH DELAYED SCHOOL ENTRY AND KINDERGARTEN RETENTION

For most children in the United States, kindergarten is the first year of formal schooling, with approximately 4 million children entering kindergarten each year (U.S. Department of Education, 2015). Kindergarten was traditionally regarded as a transitional year to prepare young children for increased academic demands starting in 1st grade. However, with increased rigor and accountability standards in the later elementary years, the kindergarten curriculum has become more academically demanding, which may augment concerns about children’s school readiness and the developmental appropriateness of kindergarten instruction (Bassok et al., 2016; Graue, 2009). Research suggests that many children struggle with the transition to kindergarten, with many students struggling with at least one aspect of the transition (such as meeting academic demands or following a schedule) (Jiang et al., 2021). One way to address concerns about this transition is by altering a child’s academic progression through delayed kindergarten entry or kindergarten retention (Mendez et al., 2015). Children who delay kindergarten entry (also known as “academic redshirting” in reference to the practice of redshirting in collegiate sports) wait one additional year to enroll in school despite being eligible based on age. Children who are retained in kindergarten enroll in school on time but repeat their kindergarten year.

Both of these interventions, often referred to as the “gift of time,” are grounded in the assumption that children who are not deemed ready to start formal schooling or progress to the 1st grade will benefit from an extra year to mature or develop grade-appropriate skills (Carlton & Winsler, 1999; Frey, 2005; Graue & DiPerna, 2000). However, delayed entry is a more “proactive” strategy that is implemented before a child starts school to allow them to more time to develop, or in some instances, to give students an advantage over their peers (Fortner & Jenkins, 2017; Frey, 2005; Mendez et al., 2015). In contrast, grade retention is a more “reactive” strategy that is implemented after children have started school and appear to be lagging behind their peers (Mendez et al., 2015). Educators and researchers have historically considered delayed entry a “positive alternative” for kindergarten retention (Jones & Sutherland, 1981).

A great deal of empirical work has studied the outcomes of delayed kindergarten entry and retention separately, but little research has examined these interventions together even though they are often predicated on similar assumptions and used with generally similar groups of children. Research examining delayed entry and kindergarten retention together is important for several reasons. First, delayed-entry and kindergarten-retained students from the same cohort are both old-for-grade and will progress through 1st grade and onward at the same time, meaning they will be similar ages as they encounter new curricula. Having groups of similarly aged children removes the potential confound of age when studying academic outcomes of off-track students, and few studies have taken advantage of this comparison. Further, though delayed entry is considered a more proactive strategy, it is also typically used with more economically advantaged

children, whereas retention tends to be used with less advantaged children (Mendez et al., 2015). These disparities are discussed more below. Given the disparities in ethnicity and income between children who delay entry or are retained, it is important from an equity standpoint to understand how interventions that are used with different groups of children are related to academic success (Mendez et al., 2015). Finally, studying retention and delayed kindergarten entry together can offer more insight into whether altered school progressions in the early elementary years promote academic success and prevent later failure. Though grade retention is more strongly associated with academic failure compared to delayed entry, both practices intend to “level the playing field” as children enter school late or repeat an academic year.

Prevalence and Trends

Delayed Entry

Recent estimates suggest that in the United States, approximately 3 to 7% of students on average delay kindergarten entry (Bassok & Reardon, 2013; Fortner & Jenkins, 2017; Graue & DiPerna, 2000; Huang, 2015). However, these estimates vary substantially by region with higher rates of delayed entry in more affluent schools/communities (Fortner & Jenkins, 2017; Hanly et al., 2019). For example, Graue and DiPerna (2000) surveyed a state representative sample of students from Wisconsin and found that, on average, 7% of children entered kindergarten one year later than when they were initially eligible, though this range varied considerably across communities. Similarly, Fortner and Jenkins (2017) found that approximately 4% of students delayed entry in a statewide administrative sample of students from North Carolina but that rates

were lower for school districts serving higher proportions of low-income students. Another study assessed the prevalence of delayed entry in a low-income, ethnically diverse sample in Miami and found that only 1% of children experienced delayed kindergarten entry (Greenburg & Winsler, 2020). Further, Huang (2015) investigated the state-wide prevalence of delayed entry in Virginia and found that while approximately 3% of students delayed entry across the state, rates ranged from approximately 2 to 5.5% when schools were stratified by SES quartiles.

Kindergarten Retention

According to the National Center for Education Statistics, about ten percent of students in kindergarten through 8th grade are retained at some point during these school years, with a high proportion of students being retained in the early elementary years (Planty et al., 2009; Warren et al., 2014). These rates have remained relatively stable since 1996 and tend to be higher for Black and Latinx children and low-SES students (Planty et al., 2009). Retention rates tend to be higher compared to delayed entry rates, particularly in less-affluent communities (Dauber et al., 1993). For example, in a low-income sample from Miami, Florida, approximately 1% of students delayed entry, but 4% of students in a similar sample were retained in kindergarten (Greenburg & Winsler, 2020; Winsler et al., 2012). Few estimates have been given for the prevalence of kindergarten retention specifically, but some research using statewide and community samples suggests that approximately 4% of kindergarteners are retained (Huang, 2014; Winsler et al., 2012). However, as with delayed entry, rates can fluctuate based on school characteristics (e.g., the proportion of students in poverty; Davoudzadeh et al., 2015).

Changes in School Entry Age

Related to concerns about school readiness and decisions to delay entry or retain are state cutoffs for kindergarten entry. Between 1975 and 2000, 22 states moved their cutoff date for kindergarten entry so that students would be older when they started school (Stipek, 2002), and states have continued to change these cutoffs (Education Commission of the States, 2018; Lenard & Peña, 2018). For most states, the kindergarten entry cutoff is between September 1st and 15th, meaning children must be five on or before that date in order to be eligible to enroll in kindergarten. By moving state cutoff dates, stakeholders hope that children will be more prepared to start and succeed in school (Stipek, 2002). Emphasis on accountability and standardized testing likely prompted much of this change, and some work does suggest that changes in state cutoffs are associated with slightly higher state-level achievement (Fletcher & Kim, 2016; Stipek, 2002). As states continue to implement mandatory retention policies (most often in 3rd grade) that are tied to standardized test scores, it is likely that the debates surrounding appropriate school starting age will continue. The emphasis on older children being more prepared for formal schooling and standardized testing represents part of the motivation to delay school entry and is one of the frameworks used to justify altered kindergarten progressions.

Theoretical Frameworks

Maturationist Theory

The intuitive appeal of delayed entry and retention is that they both allow children an additional year to develop and gain school readiness skills. Such notions of readiness

are often described as a “maturationist perspective” of development and assume that school readiness and the capacity to learn are primarily related to age (Carlton & Winsler, 1999; Graue & Diperna, 2000). This perspective is most aligned to the popular description of delayed kindergarten entry and retention as the “gift of time.” The maturationist perspective assumes that if a child is not deemed to be “ready” to start school or to progress to 1st grade, holding them back for a year would be theoretically beneficial given the perception that older children should be more socially/academically mature. Some research does indicate that relatively older children outperform their younger peers in the early elementary years, though this gap becomes smaller over time (Huang & Invernizzi, 2012). With an additional year of childcare/preschool, staying at home, or repeating kindergarten, a child should presumably be more prepared to cope with later academic challenges.

Maturationist perspectives of school readiness are often contrasted with sociocultural perspectives of readiness (Carlton & Winsler, 1999). These perspectives view school readiness as a more interactive process between children and schools such that children will have more developmental opportunities alongside their same-age peers. In this sense, children may be disadvantaged by delaying school entry or being retained because it would prevent them from being in the very context that would promote learning and development in the first place (Carlton & Winsler, 1999). Some research suggests children who are retained learn less than they would have had they been promoted, possibly because they are not introduced to new academic challenges (Vandecandelaere et al., 2016). Similarly, unless enrolled in a high-quality pre-K

program or another arrangement, delayed-entry students may also lack academic challenges that would promote positive development. Notably, the distinction between strict maturationist and sociocultural perspectives when evaluating delayed entry is not sharp given the availability of early childcare arrangements. Depending on the opportunities parents can afford prior to school entry, it is possible that children may attend a program that can promote development to the same extent as would kindergarten.

Social Comparison: Frames of Reference and Self-Concept

Another theoretical consideration for evaluating the effects of altered academic progressions is children's frame of reference. Research indicates that individuals achieve more if they feel competent and confident compared to others (Marsh & Hau, 2003). In education, this is referred to as the "big-fish-little-pond effect" (BFLPE; Marsh, 1987). According to the BFLPE, the academic self-concept of individual students is partially related to the achievement of their peers (Marsh & Hau, 2003). Equally-abled students may feel less competent when surrounded by high-achieving peers, but more competent when surrounded by lower-achieving peers (Marsh, 1987). Generally, off-track students are relatively older than their same-grade peers when they repeat a grade or enter school late, which may lead to positive self-concepts (and theoretically higher achievement) if they view themselves as more competent or mature than their classmates. Particularly for retained kindergarteners, having accumulated a year's worth of knowledge and socialization may allow these students to feel more knowledgeable compared to first-time peers and boost their achievement (Hong & Yu, 2008). There is some evidence that being

older than peers may indeed boost self-esteem. For example, Plummer and Graziano (1987) found that retained students had higher self-esteem compared to regularly-promoted peers. Further, when presented with a vignette about retained and non-retained students, non-retained students were more likely to choose the retained student as a partner for an academic activity because the retained student had more experience in school.

In contrast, if labels associated with delayed entry or retention are negative (e.g., incompetent, unprepared), this may elicit negative social comparisons (Pagani et al., 2001). Young children view grade retention as a stressful life event, which could lead to lower academic self-concepts/achievement, specifically if old-for-grade children feel different or alienated from their younger peers (Anderson et al., 2005; Hong & Yu, 2008). For example, Peixoto et al. (2016) found that retained students had lower academic self-concepts compared to their peers. These negative effects may be exacerbated if retained or delayed-entry students feel rejected by their peers. In older grades, children who are retained report fewer same-grade friendships compared to their peers (Demanet & Van Houtte, 2016). However, some counterarguments claim that kindergarteners may be too young to process these social comparisons, making early altered progressions less harmful (Hong & Yu, 2008). For this reason, the early timing of delayed entry and kindergarten retention is a reason that may theoretically support the efficacy of interventions such as delayed entry or kindergarten retention.

Timing

The timing of retention is important to consider when contextualizing the outcomes associated with these altered progressions. A common justification for grade retention and delayed entry is that children who are held back early can gain an edge over their peers and perhaps be more successful throughout their schooling. Such an advantage may not be available with later intervention. Further, being off-track, particularly for retained students, is generally associated with negative outcomes and stigmatization (Jimerson, 2001; Martin, 2009). However, early grade retention is viewed more positively because it may allow children more time to recover from the potential stress associated with being retained and may be less stigmatizing. For example, Jacob and Lefgren (2009) found that children who were retained in 6th grade were just as likely as their peers to complete high school, but children retained in 8th grade were more likely to drop out of school. Further, because delayed entry happens before school entry and is generally a voluntary decision (as opposed to being recommended by the school), it may be somewhat removed from the stigma associated with grade retention (Graue & DiPerna, 2000; Jones & Sutherland, 1981). As such, these early altered school progressions may be more positive compared to those that occur later.

Selection into Delayed Entry and Kindergarten Retention

Because delayed entry and kindergarten retention are not random interventions, it is important to understand the characteristics that distinguish delayed-entry and retained students from their typical peers. These characteristics, often described as “selection effects,” must be accounted for when studying the outcomes associated with altered

kindergarten progressions. Otherwise, differences in later academic outcomes may reflect differences based on children's initial characteristics as opposed to their altered school progressions. Though much research has examined the differences between on-time students and delayed entry/retained students, little research has compared these two different groups of off-track students and is an important contribution of this study.

Delayed Entry

Many characteristics distinguish delayed entrants from their typically progressing peers. Previous research has consistently found that students who delay entry are more likely to be White, male, affluent, and younger (i.e., have birthdays close to the kindergarten cutoff) (Bassok & Reardon, 2013; Cosden et al., 1993; Fortner & Jenkins, 2017; Graue & DiPerna, 2000; Greenburg & Winsler, 2020; Winsler et al., 2012). Students who delay entry are also more likely to receive special education services when they arrive at school compared to their on-time peers (Fortner & Jenkins, 2017; Greenburg & Winsler, 2020). Further, while some families may hold typically- to high-functioning students out of school for a year (sometimes referred to as "positive selection"), most delayed entrants appear to be more academically at-risk, are more likely to receive special education services, and score more poorly on readiness indicators ("negative selection"; Fortner & Jenkins, 2017; Greenburg & Winsler, 2020). Some evidence also suggests that physical size may be associated with the propensity to delay entry. Research finds that children who are born pre-term or have low birthweights are more likely to delay school entry compared to their peers (Bassok & Reardon, 2013;

Hanly et al., 2019); Noel and Newman's (2003) qualitative study also found that some mothers specifically mentioned physical size when considering reasons to delay entry.

Indeed, a qualitative study found that many mothers who chose to delay kindergarten entry were concerned with their child's readiness for formal schooling (Noel & Newman, 2003). This concern was particularly strong for young boys. The propensity for boys to be delayed at higher rates compared to girls seems to have roots in the "failing boys" narrative (i.e., that boys are necessarily disadvantaged in early education compared to girls) and parents' perceptions that they are leveling the playing field rather than "tilting" it by allowing young boys more time to grow to be more comparable to their peers in terms of size, height, and athletic ability (Albanesi, 2019). Importantly, however, Albanesi's (2019) study was conducted with a relatively privileged sample in terms of race and income (90% White, predominantly high income), suggesting that concerns cited in this study may not generalize to more diverse populations. Recent quantitative research also suggests that boys struggle more with kindergarten transitions (e.g., adjusting to academic demands, making friends) compared to girls (Jiang et al., 2021). Further, rates of delayed entry are higher among more affluent families and communities, likely given the economic burden of holding children out of school for another year. Younger children tend to be held out of school given concerns that young children, and young boys in particular, may not be prepared to meet the demands of formal schooling (Graue & DiPerna, 2000).

Kindergarten Retention

Many of the characteristics that distinguish delayed entrants from their typical peers are the same ones that distinguish children who are retained in kindergarten. Generally, studies find that compared to typically progressing children, students that are retained in kindergarten or early elementary school tend to be male, younger, receive special education services, and perform more poorly on school readiness measures (Dauber et al., 1993; Davoudzadeh et al., 2015; Graue, 2009; Huang, 2014; Winsler et al., 2012). As with delayed-entry students, on-time kindergarteners that are relatively younger than their peers may be perceived as less academically competent or mature, which could lead to a retention recommendation (Graue & DiPerna, 2000).

Unlike delayed entry, however, students that are retained tend to come from less affluent households and are more likely to be students of color (Dauber et al., 1993; Graue & DiPerna, 2000; Huang, 2014; Winsler et al., 2012). However, some research also indicates that students of color are *less* likely than their White peers to be retained in kindergarten after controlling for school entry skills and poverty (Huang, 2014; Winsler et al., 2012). This trend has only been seen in studies assessing kindergarten retention; in other grades, students of color are consistently held back at higher rates compared to their peers (Locke & Sparks, 2019; Warren et al., 2014). It can be speculated from the extant literature that compared to delayed-entry students, retained students are more likely to be low-income students of color. It is unclear, however, whether these groups of students will be similarly poor performing prior to school entry. As such, this dissertation examined the school readiness of delayed-entry and retained students.

Outcomes Associated with Delayed Entry and Retention

Comparison Groups: Same-Age vs. Same-Grade

When studying outcomes for off-track students, researchers must decide whether to compare these students to their on-time peers when they are in the same grade (and the off-track students are one year older when they are tested) or when they are the same age (and the off-track students are one grade-level behind). There is debate over which comparison should be used, though both are used frequently in the literature (and sometimes within the same study). This debate is also common in retention studies; studies examining outcomes associated with delayed entry often use same-grade comparisons, particularly because age effects may be swamped by schooling effects (Datar, 2006). Some researchers argue that in retention studies, same-grade comparisons more accurately compare the academic trajectories of off-track and on-time students (Vandecandelaere et al., 2016), though some researchers find similar results between the two comparisons (Mantzicopoulos & Morrison, 1992; Schwerdt et al., 2017). Same-grade comparisons, however, may be more ecologically valid as test scores in a particular grade are the basis for future educational decisions and may be more consistent with the purpose of retention (to give students an extra year to meet grade-level standards; Datar, 2006; McCombs et al., 2009; Steiner et al., 2016). I note below the type of comparison used when discussing the outcomes associated with grade retention; comparisons groups for the delayed-entry studies below are all same-grade.

Delayed Entry

Empirical research to date has yielded mixed findings regarding outcomes associated with delaying kindergarten entry. Some studies find that older children are advantaged in the early academic years but that these advantages decrease in magnitude over time (Dagli & Jones, 2013; Datar & Gottfried, 2015), with some research indicating that delayed-entry students are more likely to drop out and less likely to attend college (Lincove & Painter, 2006). For example, Dagli and Jones (2013) examined math and reading outcomes of children who experienced early, on-time, or delayed kindergarten entry. They found that children who delayed entry performed better than on-time peers in math and reading at the beginning of kindergarten but not by 3rd grade. However, after accounting for relative age (the extent to which a child is older or younger compared to their classroom peers), findings suggested that delayed-entry students performed better in 3rd grade *if* they were relatively older than their classmates. Further, Datar (2006) examined the outcomes of delayed-entry students through 1st grade and found that delaying entry for a year was associated with higher math and reading scores. Growth trajectories for delayed-entry students were also steeper compared to on-time students, suggesting that these students experienced more rapid test score gains through the end of 1st grade. Fortner and Jenkins (2017) examined the outcomes of delayed-entry students in 3rd grade and found that delayed entry was associated with significantly higher math and reading scores. Importantly, they found these effects were stronger for “positively selected” delayed entrants (defined as students without an identified disability).

In addition to differences in academic outcomes, some researchers have examined whether delayed-entry students are advantaged in terms of social-behavioral skills. For example, Datar and Gottfried (2015) found that children who entered kindergarten one year later than their eligibility scored better on various social-behavioral indicators compared to younger peers (e.g., fewer behavior concerns). These differences persisted throughout elementary school with delayed-entry students exhibiting fewer internalizing problems through 5th grade and fewer externalizing problems through 3rd grade. The authors did note that these differences were relatively small and decreased in magnitude over time. These researchers also examined math and reading skills for delayed-entry students and found that these students outperformed younger, on-time peers on math outcomes in elementary school, but that these differences faded throughout middle school.

Though several studies indicate small advantages for delayed-entry students in the early elementary years, others find no differences between delayed-entry and on-time students. For example, Cameron and Wilson (1990) compared the outcomes of four groups of children on reading and math in the 2nd and 4th grades. These children were delayed entrants, and “older,” middle,” and “younger” children who entered kindergarten on-time. Controlling for cognitive ability measured by the Cognitive Abilities Test administered in 1st grade, researchers found that older children outperformed delayed-entry and the other on-time groups on 2nd-grade reading, but that these differences were not significant in 4th grade. There were no differences between delayed-entry and on-time students for math. This suggests that it may be important to account for pre-existing

differences between delayed-entry and on-time students prior to kindergarten entry. Further, Graue and DiPerna (2000) found no differences between delayed-entry and on-time students on a 3rd-grade reading test, though notably, this study did not include important child-level control variables like many previously discussed studies. Finally, in a well-controlled study, Mendez et al. (2015) explored the outcomes of delayed-entry students through 8th grade. They found that students who experienced delayed kindergarten entry generally performed similarly on various outcomes (e.g., teacher ratings of attitude toward school, behavior) compared to typically progressing peers through 8th grade. Some small but statistically significant differences emerged on reading and math scores, with delayed-entry students scoring slightly lower.

Early Grade Retention

While the outcomes associated with delayed kindergarten entry tend to be null or positive, effects associated with grade retention tend to be more negative. Though early grade retention tends to be viewed more positively than later grade retention, research suggests that even retention in elementary school (kindergarten through 5th grade) can substantially reduce odds of graduating high school and is not associated with improved academic achievement (Andrew, 2014; Graue & DiPerna, 2000; Hong & Yu, 2008).

Hong and Raudenbush (2005) studied the effects of kindergarten retention on both school-level and individual achievement. They found few differences in achievement among schools that adopted kindergarten retention policies, suggesting that such policies are not effective. Further, same-grade comparisons indicated that at-risk students who were retained performed more poorly in reading and math than their at-risk

promoted peers at the end of 1st grade. Hong and Raudenbush (2006) also examined whether the academic effects associated with kindergarten retention varied for students in high-retention schools (schools with more retainees) compared to low-retention schools. This study found that in both low- and high-retention schools, kindergarteners who were retained would have learned more had they been promoted to 1st grade on time. Notably, these studies had a relatively short follow-up period.

Hong and Yu (2007, 2008) also conducted a series of studies to examine outcomes associated with early grade retention. Hong and Yu (2007) studied academic outcomes associated with kindergarten retention through 5th grade. Same-grade comparisons suggested that children who were retained in kindergarten performed more poorly in reading and math at the end of their repeated year, but that these negative effects had almost disappeared by the end of 5th grade. In this study, retained students showed faster growth rates in math and reading compared to promoted students. Hong and Yu's 2008 study examined the social/emotional effects associated with kindergarten retention during the same period. Retained kindergarteners had higher perceived competence and interest in learning two years post-retention than those promoted to 1st grade. These findings suggest that retention in kindergarten may not be associated with negative outcomes for children's social/emotional development. Similarly, Wu et al. (2010) found that being retained in 1st grade had a positive effect on children's perceived academic competence in 4th grade, though retained and promoted students showed no differences on this outcome in 2nd or 3rd grade. They also found that retained students had

a short-term boost in peer-rated liking and school belonging, though these effects decreased in the longer-term.

Other studies find an initial short-term boost in academics for children who are retained. For example, Mantzicopoulos and Morrison (1992) used both same-age and same-grade comparisons to examine the outcomes of kindergarten-retained students to matched promoted students through the end of 2nd grade. Results (for both same-age and same-grade comparisons) indicated that retained students outperformed their promoted peers on math and reading their second time through kindergarten, but that this advantage was no longer present once children completed 1st grade. Moser et al.'s (2012) same-grade comparisons similarly found that children retained in 1st grade experienced a one-year boost in math and reading scores, but that this effect dissipated by the end of 5th grade.

Finally, Vandecandellare et al. (2016) examined development in mathematics for children who were retained in kindergarten, 1st grade, and continuously promoted children. Same-age comparisons indicated that children retained in kindergarten or 1st grade would have benefitted more from being continuously promoted. Importantly, however, children who were retained in kindergarten appeared to perform at similar levels compared to promoted peers by the end of 5th grade, while differences remained significant for children retained in 1st grade. The authors suggest that children who struggle academically early in school may benefit more from being held back in kindergarten compared to be retained in 1st grade.

Similarities between Delayed Entry and Retention Outcomes

The outcomes associated with early grade retention and delayed entry are similar in that both groups seem to experience an initial boost in academics but that the magnitude of these effects tends to decrease over time. For both interventions, this creates a fuzzy definition of success where short-term gains must be considered against the longer-term risks of being old-for-grade (Martin, 2009). Despite these similarities, the findings associated with delayed entry tend to be more consistently positive. On the other hand, many retention studies suggest that after an initial improvement during the repeated year, students continue to perform more poorly and learn less compared to promoted peers. Importantly, most studies discussed above take important selection effects into account to control for initial differences between off-track students and their typically progressing peers. These findings suggest that even accounting for these factors, children who experience early retention may experience more negative outcomes compared to those who delay entry when both groups are compared to typical students.

Another key similarity between delayed-entry students and those who are retained early in elementary school is that they are less likely to be retained later in their school trajectories (May et al., 1995; Schwerdt et al., 2017). Such outcomes are important in the context of the standards-based reform movement in education (often linked to the No Child Left Behind Act of 2002). In many states, children who do not demonstrate reading proficiency by 3rd grade are required to be retained, but exceptions can also be granted to students who are already off-track. Limited research has explored the extent to which delayed-entry and early-retained students have met grade-level requirements for

promotion and is an important context for research. Even if delayed-entry/retained students do not experience boosts in tests scores, they may still be able to avoid later failure in grade if they are more likely than similar peers to be promoted later on in school.

Delayed Entry and Retention Together

Few studies have directly compared students who were retained and those who delayed entry. Among those that have, only one (Mendez et al., 2015) rigorously accounted for selection effects. Graue and DiPerna (2000) found that students who were retained in kindergarten performed more poorly than both on-time and delayed-entry students on a 3rd-grade reading test, though this study did not account for selection effects. Kundert et al. (1995) compared the outcomes of delayed-entry and students who were retained between kindergarten and 5th grade. Accounting for IQ (measured by the Cognitive Abilities Test administered in 2nd grade), there were no differences in 2nd, 5th, or 7th grade on a comprehensive assessment test between students who delayed entry or those who were retained in elementary school. Lincove and Painter (2006) compared the outcomes of delayed-entry students and children who were retained in kindergarten through 8th grade. Their results indicated that retained children were more likely to drop out of school and less likely to attend college but had higher incomes at age 25. Finally, Mendez et al. (2015) used a variation on propensity score stratification to account for selection effects among students who were retained in kindergarten, delayed entry, or were typically progressing. Analyses were also split between students who paid for lunch and those who received free lunch. In the paid-lunch group, comparisons between

delayed-entry and retained students indicated that retained students performed more poorly than their delayed-entry peers on standardized achievement tests in 3rd, 5th, and 7th grade. However, fewer results were statistically significant for students who received free lunch, suggesting that effects may vary by lunch status (a commonly used proxy for poverty status in education research). It is possible that children from lower-SES backgrounds are at higher risk for poor academic performance compared to their peers, meaning altered kindergarten trajectories may have less of an effect on this group of children.

Individual Differences: Children with Disabilities

Because some studies (Fortner & Jenkins, 2017; Mendez et al., 2015) find that outcomes following delayed entry and retention are moderated by child characteristics, it is important to consider how individual differences might be related to the effects associated with being off-track. These differences warrant consideration because it is not yet clear whether vulnerable children, such as students with disabilities, benefit more from these early interventions compared to their peers. While it is possible that at-risk children have more to gain by delaying entry or being retained, it is also possible that these children (particularly those that delay entry) have less access to support services or quality peer interactions with altered school progressions. One important group that has begun to receive more attention in the literature is students with disabilities. Prior research consistently indicates that children who delay entry or are retained are more likely to have a disability at some point compared to typically progressing peers (Davoudzadeh et al., 2015; Fortner & Jenkins, 2017; Greenburg & Winsler, 2020; Huang,

2014; Mendez et al., 2015). Some research suggests that up to 67% of children who are diagnosed with a learning disability are retained before being referred for special education services (Barnett et al., 1996). Further, delaying kindergarten entry may restrict access to high-quality intervention services that may not be available outside of the school setting. As such, it is important to examine whether outcomes vary for students with disabilities who experience an altered kindergarten progression.

Few studies have examined the extent to which delaying entry is associated with differential outcomes for children with disabilities. Fortner and Jenkins (2017, 2018) found that delaying kindergarten entry for children with disabilities is associated with poorer performance in 3rd grade but higher performance for children without disabilities. Disability status was identified in 3rd grade. In their 2018 study, Fortner and Jenkins explored whether outcomes vary by type of disability. They found that with the exception of children with speech-language disorders, most delayed-entry children with disabilities had poorer performance than their peers with disabilities who entered school on-time. Specifically, children with cognitive disabilities, learning disabilities, and other health impairments had lower performance, but children with speech-language disorders had higher performance compared to on-time children with similar disabilities. They suggest that children with disabilities benefit from entering school on time.

However, Datar (2006) suggests that delaying kindergarten entry may be beneficial for children with disabilities. Her analyses suggested that children with disabilities who delayed entry for a year scored on-par with non-disabled children who entered school the year prior. Datar (2006) argues that these findings suggest that

delaying entry compensates for the disadvantage of having a disability in terms of test scores. In this study, children were identified as having a disability prior to kindergarten entry if they were diagnosed with attention deficit disorder, hyperactivity, coordination problems, communication difficulties, hearing or vision impairment, or received any kind of therapy.

Similarly, limited research has explored whether outcomes associated with grade retention are moderated by disability status. Keller-Margulis and Gischlar (2014) examined the academic outcomes of elementary school children who had been diagnosed with a reading disability at some point in elementary school; approximately 57% had been retained. Students were assessed using the Woodcock-Johnson at the time of their referral for special education services; students were assessed at different grade levels, though grade of referral was not specified. Retained students scored lower on reading comprehension, math calculation, and math reasoning skills compared to students who had been continuously promoted. However, this study notes that children who were promoted were higher functioning at the time of referral for special education services, meaning differences in scores may reflect initial child differences. Retained students were also not monitored as frequently as promoted students, suggesting that they may not have received specialized instruction as early as their promoted peers.

Overall, the limited research on delayed entry and retention for children with disabilities makes it difficult to determine the extent to which these interventions are appropriate for these students. As such, a focus of this dissertation was to examine whether academic outcomes for children with altered kindergarten progressions differ for

children with disabilities. This is an important focus given the high proportions of students with disabilities who delay entry and who are retained.

The Current Study

The purpose of the present study was to explore how children who experience an altered kindergarten progression compare to each other as well as to their on-time peers throughout elementary school. Additionally, I explored whether academic outcomes following these varied progressions were moderated by disability status. Though there is a substantial body of literature that explores outcomes associated with altered kindergarten progressions compared to on-time students, limited research directly compares students who delay entry or experience kindergarten retention. Further, limited research has explored whether these progressions are differentially associated with outcomes for children with disabilities. Particularly given the racial and economic disparities among children who are retained compared to those who delay entry, it is important to understand whether either of these altered kindergarten progressions serve to exacerbate or ameliorate early achievement gaps.

The foundation for this proposed project was established through two previous papers exploring the predictors and outcomes associated with delayed entry within a sample similar to the one used in this paper. These papers explored characteristics and outcomes of delayed-entry students in comparison to their on-time peers; the current project extended these questions to a third group of students who experience kindergarten retention.

Greenburg and Winsler (2020) explored the prevalence and predictors of delayed entry within a predominantly low-income, ethnically diverse sample of students from Miami-Dade County, Florida. This paper built upon findings of Winsler et al. (2012) who explored the predictors of delayed kindergarten entry and kindergarten retention using only 3 cohorts of students. Greenburg and Winsler examined predictors of delayed entry across 5 cohorts (all sampled cohorts) of students. Results indicated that only about 1% of this sample delayed entry to kindergarten. Delayed entry was more common among younger students (those with birthdays closer to the kindergarten eligibility cutoff), native English speakers, children who attended center-based childcare (as opposed to public school pre-K), White children, and children with poorer school readiness skills. Bivariate associations indicated that boys had higher odds of delaying entry, but this association disappeared after accounting for school readiness skills, suggesting that boys are more likely to delay entry due to poorer school readiness skills. Students who delayed entry were also more likely to receive special education services upon kindergarten entry compared to their on-time peers. Though some students appeared to score particularly well on school readiness indicators, most students appeared to score more poorly than their on-time peers, suggesting that the majority of delayed entrants were negatively selected into this progression.

Greenburg and Winsler (2021) explored the early academic outcomes of this same group of students and found that while delayed-entry students outperformed their on-time peers in kindergarten, these associations disappeared by 1st grade. In 2nd grade, delayed-entry students performed more poorly than their on-time peers on GPA and standardized

math and reading assessments, even after accounting for a variety of covariates (e.g., school readiness, demographics). We conducted these same analyses with just students with disabilities and found similar results, suggesting that delayed entry was not differentially associated with later outcomes for this group of students.

In sum, the contributions of the current paper are 1) to clarify the selection patterns among children with different kindergarten progressions, specifically comparing those who delay entry to those who are retained in kindergarten, 2) to examine the academic outcomes among children with different kindergarten progressions through the end of elementary school, again, with the novel comparison of children who delayed entry to those retained, and 3) to provide further evidence regarding the outcomes associated with varied kindergarten progressions for children with disabilities, which has yet to be extensively studied.

Research Questions and Hypotheses

This study addressed the following research questions:

1. How do children who delay entry or are retained in kindergarten differ on demographics and school readiness skills compared to each other and to children who enter school on-time?
2. Do children who delay entry or are retained in kindergarten perform differently in kindergarten, 3rd grade, and 5th grade compared to each other and to typically progressing students, after accounting for selection effects?
3. What proportion of delayed-entry, kindergarten-retained, and typically progressing students receive special education services in elementary school?

- a. When do students in each progression category first receive disability services from the schools?
4. Do academic outcomes in kindergarten, 3rd grade, and 5th grade following altered kindergarten progressions differ for students who receive special education services?

Based on the extant literature, I hypothesized that children who delayed entry/are retained would be more likely to be younger, male, and have poorer school readiness skills compared to on-time students. Further, I predicted that delayed-entry students were more likely to be White (compared to both retained and on-time students), whereas retained students were more likely to be Black and Latinx. Given that the majority of delayed-entry students in this sample are negatively selected, I predicted that there would be no differences in school readiness scores for delayed-entry students compared to those who are retained in kindergarten.

In regard to outcomes, I expected that children who experienced altered progressions would outperform their on-time peers in kindergarten (the second time through kindergarten for retained students), but that this advantage would not be present by 3rd or 5th grade. This is representative of the “struggle-succeed-struggle” trajectory that is often seen with off-track students (Wu et al., 2010). I expected that academic outcomes would be similar for delayed entry and retained students throughout elementary school. Though the extant literature generally suggests more positive outcomes associated with delayed school entry, this does not appear to be the case within the current sample of students (Greenburg & Winsler, 2021). Finally, I expected that children who delay entry

or are retained in kindergarten would be less likely to be retained between kindergarten and 5th grade given that they were already behind their same-age peers.

Finally, with regard to special education status, I expected that there would be higher proportions of special education students in the altered kindergarten progression groups compared to on-time students, and that these students would be identified for services earlier than their on-time peers. This is to be expected given that these altered progressions are more common among academically vulnerable students. I did not expect that outcomes would be moderated by disability status in kindergarten given the results of Greenburg and Winsler (2020b) and that off-track students generally experience a boost in academic performance immediately following their delayed entrance/retention. Though some extant literature suggests that children with disabilities who delay entry perform more poorly than their peers in 3rd grade, I expected that patterns in this sample would be similar to those hypothesized in kindergarten—outcomes associated with delayed entry in 3rd and 5th grade would not be moderated by disability status.

METHOD

Participants

Participants for this study were drawn from the larger Miami School Readiness Project (MSRP; Winsler et al., 2008), a large, ethnically diverse sample of predominantly low-income students who attended preschool in Miami-Dade County between 2002 and 2007. These data represent a larger, ongoing project involving the assessment of school readiness and later educational outcomes for children attending a variety of early childhood programs (Ansari et al., 2017; Winsler et al., 2008). These children were prospectively followed from pre-K into the Miami-Dade County public school system (MDCPS). The children in the MSRP represent nearly all (92%) of children who were enrolled in public-school pre-K or received childcare subsidies at age four between 2002 and 2007. All public-school pre-K programs and childcare providers who accepted subsidies participated with recruitment (Ansari & Winsler, 2016). Children of families who received childcare subsidies attended either center-based or family childcare. Children who attended Head Start exclusively, who attended childcare without subsidies, or who were cared for exclusively by family members were not included in the MSRP. The MSRP represents approximately 55-60% of low-income 4-year-olds in Miami-Dade County (Ansari & Winsler, 2016).

Children qualified for inclusion in the current study if they were eligible to start kindergarten following their pre-K year according to their date of birth and county cut-off date for kindergarten entry (September 1), if they completed kindergarten, evidenced by having end-of-year grades for kindergarten, and if they followed one of the kindergarten progressions (delayed entry, kindergarten retained, typically progressing) as defined below. Children who attended public school pre-K specifically for children with disabilities at age four ($n = 2,474$) were excluded, though typically developing children who served as role model students in such programs remained in the sample. This inclusion criteria resulted in an overall sample of 26,207 students. Descriptive statistics for this sample are presented in Table 1. Approximately 1% of these students delayed entry, 4% were retained in kindergarten, and 95% were typically progressing. The sample is ethnically diverse (57% Latinx, 35% Black, 7% White/Asian/Other), and the majority (79%) are in poverty as indicated by kindergarten free/reduced lunch (FRL) status. Half of the students in this sample are male, and slightly over half are English Language Learners (ELL).

In terms of representativeness, this subsample represents approximately 16-25% of MDCPS's kindergarten cohorts between the 2003/2004-2007/2008 academic years (Miami Dade County Public Schools). The ethnic breakdown in the current sample was relatively similar to the Miami Dade County Public Schools breakdown in the 2003/2004-2007/2008 academic years. Between these academic years, between 9-10% of district students were White, 26-29% of students were Black, and 59-62% of students were Latinx. The current sample is more in-poverty compared to the overall school

district between these years, however. Between the 2003/2004 and 2007/2008 academic years, approximately 68-72% of elementary school students in MDCPS qualified for free or reduced-price lunch.

Measures

Kindergarten Progressions

Delayed Entry. Students were coded as a delayed entrant if they 1) did not complete kindergarten with their cohort despite being eligible for kindergarten based on age, but 2) appeared the following year as a kindergartener in the school district, and 3) completed the year as indicated by having end-of-year grades.

Retained. Children who were retained in kindergarten were identified if they 1) appeared in kindergarten on-time with their cohort, 2) completed the year as indicated by having end-of-year grades, and 3) completed kindergarten *again* the following year complete with end-of-year grades a second time.

On-Time/Typically Progressing. Children were identified as typically progressing if they 1) appeared in kindergarten on-time with their cohort, 2) completed the year as indicated by having end-of-year grades, and 3) progressed normally to the 1st grade, evidenced by having end-of-year grades.

Demographics/Covariates

Gender. Parents reported children's gender for school records. This study used reported gender that is collapsed across school records. Boys were given a 1 and girls were given a 0. There were only two options for gender at the time these data were collected.

Ethnicity. Parent-reported child ethnicity was provided by the school district. As with gender, this variable used information that was collapsed across student records. These reports are collapsed into three broader categories of “Latinx,” “Black,” and “White/Asian/Other.” White/Asian/Other children are grouped together given small *ns* for these groups.

FRL Status. FRL status was used as a proxy for socioeconomic status. Though FRL is limited in its reflection of a student’s household income, it does capture other aspects of disadvantage such as income volatility (Domina et al., 2018). In order to be eligible for free lunch, families must be 130% of the federal poverty line, and to be eligible for reduced-priced lunch, families must be 185% of the federal poverty line (Federal Registrar, 2006). FRL was coded as a 3-level variable: 0 = no/did not apply, 1 = reduced-price lunch, 2 = free lunch. For examining differences among different kindergarten progressions, I used FRL status from kindergarten. Children who are retained may have more than one FRL status for each grade level, so for retained kindergarteners, FRL status from the first time in kindergarten was used.

For outcome analyses, I used FRL status for the grade level being analyzed (kindergarten, 3rd grade, and 5th grade). For kindergarten outcomes, FRL status for children’s second time was used. For other grade-level analyses, I analyzed both children’s first time through a grade level and their last time; the FRL variable used was consistent with the grade-level being analyzed (e.g., FRL status for children’s first time in 5th grade was used for the analyses examining children’s outcomes the first time through

5th grade). As explained below, the results for the second-time through are reported in the main text, and the first-time through analyses are reported in the Appendix.

ELL status. Students were given a 1 on the ELL variable if they were considered an ELL at school entry. If a parent indicated on their child's school registration form that a language other than English was spoken at home or that the student had a first language other than English, the student was considered an ELL by the school district. Students who received a 0 on the ELL variable had never been considered an ELL by the school district.

Relative age. Children's age at kindergarten entry was measured by their relative age in relation to the kindergarten cutoff (September 1st) of their kindergarten year. This variable ranges from 1-12, with children receiving a 12 being the farthest away from the cutoff (i.e., the oldest in their cohorts; 12 months away from the cutoff), and children receiving a 1 being the closest to the cutoff (i.e., the youngest in their cohorts; 1 month or less from the cutoff). Age was used as a predictor variable when examining predictors of kindergarten progressions and a control variable when examining outcomes.

Childcare arrangement. The type of preschool children attended was coded as a two-level variable. A 1 indicates that children attended public school pre-K, and a 0 indicates that the child attended either family- or center-based childcare in the community on subsidies. Family- and center-based care were collapsed into one category given small *ns* for family-based care. This variable was used to examine childcare arrangement types when examining characteristics associated with the different kindergarten progressions and as a control variable when examining outcomes. During the course of the original

study from which these data were drawn, Florida also switched to a voluntary pre-kindergarten program (VPK). An additional indicator was included to account for children's cohort as being pre- or post-VPK.

Special education status. Special education status was coded in kindergarten, 3rd grade, and 5th grade based on children's primary exceptionality status. Because we receive end-of-year administrative records, it is unclear at what point during the academic year children were given an exceptionality status. I also created an overall variable to examine the total proportion of students who received special education services using the latest disability code available, and another variable to identify when a student first received services for a disability. Possible codes for disability/special education status included intellectual disability, speech impaired, language impaired, visually impaired, deaf or hard of hearing, specific learning disabled, orthopedically impaired, autistic, emotionally disturbed, emotionally handicapped, traumatic brain injured, health impaired, and gifted. Gifted students were coded as "typical." I coded this variable dichotomously (0 = no code; 1 = receives special education services in kindergarten) and multi-categorically by specific type of disability. I chose these categories following protocol similar to Fortner and Jenkins (2018) who examined delayed entry by disability type. Table 2 describes the original disability codes included in each broader category. The multi-categorical variable was used to examine proportions of each type of disability within the sample. When examining outcomes, I used the dichotomous disability status variable for the grade level being analyzed. As with the FRL variable, children's

disability status during their first or the last time through a grade level was used to be consistent with the analysis being performed.

School ID. School ID was provided by the school system. This ID was assigned based on which school the child attended for each academic year. This variable was used to account for clustering at the school level in outcome analyses. I used school ID for the grade level being analyzed (kindergarten, 1st grade, 5th grade). As with the FRL variable, children's school ID during their first time or last time through a grade level was used to be consistent with the analysis being performed.

Learning Accomplishment Profile—Diagnostic (LAP-D). The LAP-D (Nehring et al., 1992) was used to measure children's cognitive, language, and fine-motor skills at age 4. This instrument also measures gross motor skills, but the gross motor subscale was not included in the present study given the less robust investigation/empirical support for its relation to later academic domains (Macdonald et al., 2018) and because in some cohorts, this scale was administered by the preschool teacher, with lower reliability. This norm-referenced developmental assessment was directly administered to all children during their pre-K year and was available in both English and Spanish. The LAP-D was administered in whichever was the student's strongest language. Students were assessed individually by trained bilingual assessors at the beginning (T1 – fall) and end (T2 – spring) of their preschool year. Some children were also assessed earlier at age 3. Age-normed, national percentile scores from the latest timepoint assessed were used in the analyses. Of the students with LAP-D data, approximately 71% came from T2, 24% from T1, and 5% from students' 3-year-old year.

Alphas for the LAP-D range in the overall MSRP sample from .93 to .95 (Winsler et al., 2008). These variables were used as predictors when examining the differences between the kindergarten progression, and covariates when examining outcomes. Given high correlations among the subscales (r ranges from .529 to .675), a “preacademic” composite was created by averaging available information for the subscales.

Devereux Early Childhood Assessment (DECA). Preschool teachers and parents completed the DECA (LeBuffe & Naglieri, 1992) at the beginning (T1—fall) and end (T2—spring) of students’ pre-K year. Some students were also assessed at age 3. The DECA measures socioemotional skills and behavior problems. This 37-item questionnaire yields four subscales: Initiative, Self-Control, Attachment, and Behavioral Concerns. The first three subscales combine into a “total protective factors” scale, with higher scores indicating more social-emotional strengths. For behavior concerns, higher scores indicate more behavior problems. This assessment was also available in English and Spanish. The analyses used national percentiles from the latest timepoint assessed and included both teacher and parent reports. Of the students with DECA teacher data, approximately 72% came from T2, 23% from T1, and 5% from students’ 3-year-old year. Of the students with DECA parent data, approximately 67% came from T2, 28% from T1, and 5% from students’ 3-year-old year. Within the sample, alphas were good for total protective factors (.91 for parent ratings, .94 for teacher ratings) and behavior concerns (.72 for parent ratings and .81 for teacher ratings (Crane et al., 2011).

Achievement Variables

Kindergarten Performance/GPA. At the end of each academic year, students receive end-of-year grades in each of their classes/subjects. In kindergarten, grades were based on a 3-point scale with 3 = excellent, 2 = satisfactory, and 1 = not satisfactory. This variable is referred to as “kindergarten performance” in analyses and tables. In all other grade levels, grades were based on a 5-point scale with 5.0 = A, 4.0 = B, 3.0 = C, 2.0 = D, and 1.0 = F. GPAs were created by averaging the grades children received across all subject areas within each academic year. These variables were examined in kindergarten, 3rd grade, and 5th grade. Children who were retained in kindergarten had two timepoints for kindergarten outcomes; children’s second time through kindergarten was examined in analyses. For 3rd and 5th grade, if children were retained after kindergarten, both children’s first time and last time through a grade level were analyzed.

Standardized Math/Reading. Starting in 3rd grade, students take standardized math and reading tests. This assessment is the Florida Comprehensive Assessment Test (FCAT). The FCAT is a mandatory, high-stakes standardized test given to students in 3rd through 12th grade. There are two versions of the test, FCAT and FCAT 2.0. The FCAT 2.0 was first introduced in the 2011-2012 school year, so some students in this sample took the FCAT and others took the FCAT 2.0. Standard scores for the FCAT range from 100 to 500. Standard scores for the FCAT 2.0 range from 140-302.

For both versions of the FCAT, I used ordinal proficiency scores range from 1 to 5, with 1 meaning “little success with the challenging content” and 5 “success with the most challenging content” (Florida Department of Education, n.d.). A score of three is

considered “satisfactory” and indicates that the student is performing at grade level. To accurately compare scores on both versions of the test, the proficiency scores were used in the analyses and treated continuously. These scores for math and reading were examined in 3rd and 5th grade. As with GPA analyses, if children were retained after kindergarten, both children’s first time and last time through a grade level were analyzed. In 3rd grade, receiving a score of 1 on the reading component of the FCAT results in “mandatory” retention according to state policy (Stewart, 2011). As such, I created a dichotomous “pass/fail” variable in 3rd grade with students who receive a 1 coded as failing the FCAT and students who receive a 2 or higher coded as passing the FCAT reading to examine the proportion of students who fail this test.

Later Grade Retention. Later grade retention was coded similarly to kindergarten grade retention. To be considered retained in this study, students needed to have completed a given grade (indicated by end-of-year grades), then have started and completed that same grade the following year. Later grade retention was coded in 1st-5th grade. Retention in 3rd grade was examined separately to explore the proportion of students in each progression category that was held back in this grade after failing the standardized assessment required for promotion. Later retention was also included as a covariate in 3rd and 5th grade analyses. For these analyses, retention was coded until the year before the outcome grade-level being analyzed. For example, for 3rd grade analyses the last time through the grade-level, later grade retention was coded between 1st and 3rd grade.

Analytic Plan

RQ1: How do children who delay entry or are retained in kindergarten differ on demographics and school readiness skills compared to each other and to children who enter school on-time?

To answer the first question regarding selection effects associated with the different kindergarten progressions, I conducted a series of multinomial logistic regression analyses. In the first model, I used on-time children as the reference group in order to obtain on-time vs. delayed entry and on-time vs. retained comparisons. In the second model, I used retained children as the reference group in order to obtain delayed entry vs. retained comparisons. These multinomial logistic regression analyses included demographic variables (ethnicity, gender, FRL status, ELL status, age, and pre-K type) and school readiness variables as covariates.

RQ2: Do children who delay entry or are retained in kindergarten perform differently compared to each other and to typically progressing students after accounting for selection effects?

To answer the second question regarding outcomes associated with the different kindergarten progressions, I conducted a series of regression analyses to predict academic outcomes. In kindergarten, I only predicted kindergarten performance, using grades from the repeated year for students who were retained in kindergarten. In 3rd grade, I predicted GPA, standardized math, and standardized reading outcomes. As an additional analysis, I examined the proportion of students who failed (receive a 1) on the standardized reading test, and how many students were retained in this grade. In 5th grade, I similarly

examined GPA, standardized math, and standardized reading. Finally, I predicted retention in 1st through 5th grade using logistic regression. These models included demographics (ethnicity, gender, FRL status, age, ELL status, center type), school readiness skills, disability status, kindergarten performance, and kindergarten progression (delayed entry, retained, on-time) as predictors.

As noted above in the measures section, it is possible for children to have multiple data points for a single grade-level if they were retained after kindergarten (e.g., a child retained in 3rd grade would have an “on-time” 3rd grade data point and a “retained” 3rd grade data point). For 3rd and 5th grade analyses, both children’s first time through a grade and last time through a grade were examined (separately). The last time through a grade is considered the “default” model as it most accurately portrays a child’s most recent achievement in school; these results are reported in the analyses. Results for children’s first time through a grade are reported in the Appendix. Results were consistent across both sets of analyses.

RQ3: What proportion of delayed-entry, kindergarten-retained, and typically progressing students receive special education services in elementary school? When do students in each progression category first receive disability services from the schools?

To answer the third question regarding the proportion of students with disabilities in the sample, I conducted a chi square analysis to examine whether proportions vary among the different kindergarten progression groups using the “overall” disability variable. Within each group, I also examined the categories of disability types. Finally, I

also examined when students were first identified as having a disability/receiving services for disabilities.

RQ4: Do academic outcomes following altered kindergarten progressions differ for students who receive special education services?

Finally, to answer the fourth question regarding outcomes for children with and without disabilities, I conducted the same series of linear regression analyses as in question two, but with the addition of interaction terms between kindergarten progression group and disability status (delayed entry * disability status; retained * disability status, on-time * disability status). In order to obtain all 3 contrasts, I ran the models a second time changing the reference group for the interaction terms.

Attrition

Given the longitudinal nature of the MSRP, some children left the school system throughout the study. Given the inclusion criteria, all students had to have complete data for their kindergarten year. Presence in 3rd and 5th grade was determined by having end-of-year grades. Approximately 8% of students were missing end-of-year grades in 3rd grade, and approximately 13% were missing grades in 5th grade, suggesting that just over 85% of the overall sample was still present by the end of elementary school. Differences in attrition were examined by conducting chi-square analyses, and differences are discussed if results were significant at the .05 level. Notably, however, given the large sample, some statistically significant results represent very small differences. Students who delayed entry or were retained in kindergarten were more likely than their on-time peers to have left school by 3rd and 5th grade. Further, Black children were more likely

than their peers to have left the school district, as were native English speakers. Children receiving free lunch in kindergarten were more likely to have left by 3rd and 5th grade than their peers not receiving FRL. Boys were marginally more likely than girls to have left. For a full overview of sample attrition, see Table A1 in the appendix.

Missing Data

Demographic information was complete for the sample, with the exception of center type. Center type data was missing for 5.5% of students. There was substantial missingness on school readiness. On the LAP-D, approximately 33% were missing a composite score. On the DECA teacher assessment, approximately 10% were missing behavior concerns and/or total protective factors. On the DECA parent assessment, approximately 16% were missing behavior concerns and/or total protective factors. For a full overview of missing data, see Table A2 in the appendix. Differences between groups were flagged if they were statistically significant at the .05 level, though notably for some variables proportional differences were small. Children who delayed entry were more likely than their peers to be missing across all DECA scales, but not more likely than on-time students to be missing LAP-D. Children who were retained in kindergarten were less likely to be missing on LAP-D, but more likely than on-time students to be missing DECA scores. Boys were slightly more likely than girls to be missing DECA scores. Black students were less likely than their peers to be missing on LAP-D scores, but more likely to be missing the DECA. Similarly, ELL students were more likely to be missing on LAP-D, but less likely to be missing on DECA. Children receiving free lunch in kindergarten were more likely than those not receiving free lunch to be missing across all

school readiness scores. Children who attended public pre-K were more likely to be missing LAP-D, but less likely to be missing DECA. Finally, children who were flagged as having a disability between kindergarten and 5th grade were more likely than their typically developing peers to be missing DECA scores, but no different on LAP-D.

As noted above, kindergarten performance data were available for all students. However, some students were missing achievement variables for 3rd and 5th grade. Of the 24,174 students who appeared in 3rd grade (evidenced by having end-of-year grades), approximately 0.7% were missing FCAT math and reading, respectively. Of the 22,945 students who appeared in 5th grade (evidenced by having end-of-year grades), approximately 1.1% were missing FCAT reading, and approximately 1.2% were missing FCAT math. In 3rd grade, off-track students were more likely to be missing these outcomes, as were children with disabilities. Boys were also more likely to be missing FCAT scores. Patterns were similar for missingness in 5th grade. Off-track students, children receiving free lunch, Native English speakers, Black students, boys, and children with disabilities were more likely to be missing FCAT scores.

To address missing data for predictors in the regression analyses, I used full-information maximum likelihood (FIML) estimation in Mplus, which can be more computationally efficient with large amounts of missing data (Graham et al., 2007). Children were required to have end-of-year grades to be included in 3rd and 5th grade analyses, so those missing outcomes were not estimated. However, the small amounts of missing data on the FCAT were accounted for. All variables associated with missingness were included in the models.

Nesting

To account for nesting within schools in outcome analyses, I used an estimator to adjust standard errors for nesting of children within schools (type = complex function in Mplus). Children's school ID in the grade level being analyzed (kindergarten, 3rd grade, 5th grade) was used as the cluster variable in analyses. Students must have a cluster variable in order to be included in analyses. All students have a valid school ID in kindergarten, but approximately 5% of students were missing a school ID in 3rd grade, and approximately 9% of students missing a school ID in 5th grade. The majority (97% in 3rd grade, 96% in 5th grade) of students missing school ID were also missing end-of-year grades, suggesting they were not present that academic year.

To examine the distribution of kindergarten progression types across schools, I examined children's school ID in kindergarten. In this sample, children attended 241 schools. Children who entered school on-time attended all 241 of these schools. Children who delayed entry (1% of the total sample) attended 141 of these schools, with 1-6 delayed-entrants per school. Finally, children who were retained in kindergarten (4% of the total sample) attended 188 of these schools, with 1-27 retained students per school. Thus, retention and delayed entry did not appear to be a phenomenon associated with only a few outlier schools.

RESULTS

Selection into Kindergarten Progressions

I conducted a series of multinomial regressions to predict kindergarten progressions (delayed entry, retained, or on-time) based on child characteristics. The results of these models are described in Table 3. The left column describes the odds of delaying school entry compared to entering school on-time. White children had over double the odds of delaying entry compared to the Latinx and Black children in the sample. Older children (i.e., those further from the kindergarten cutoff) had lower odds of delaying school entry, as did children who were ELLs. Children who attended public school pre-K as opposed to childcare in the community also had significantly lower odds of delaying entry. Finally, children with poorer school readiness skills (pre-academic, preschool teacher-rated behavior concerns, parent- and teacher-rated protective factors) had higher odds of delaying kindergarten entry. Note that higher scores on behavior concerns means more problems (less school readiness), which is why the odds ratios are reversed compared to pre-academic skills and protective factors. Though proportionally more boys delayed school entry compared to entering school on-time (see Table 1), gender was not a significant predictor of delaying kindergarten entry when other factors are included. That is, after accounting for other child characteristics, boys in this sample did not have higher odds of delaying their entry into school.

However, gender was a significant predictor of being retained in kindergarten compared to typically progressing students (middle column of Table 3). Compared to their on-time peers, boys had higher odds of being retained in kindergarten even with other variables in the model. Further, children who received free lunch in kindergarten also had higher odds of being retained in kindergarten. Similar to children who delayed kindergarten entry, older children and those who attended public school pre-K had lower odds of being retained. Finally, children with poorer school readiness skills (pre-academic, teacher-rated behavior concerns, parent- and teacher-rated protective factors) had higher odds of being retained in kindergarten. Ethnicity was not a significant predictor of kindergarten retention; there were no differences in the odds of being retained among Black and Latinx children compared to White children with other factors controlled.

To obtain comparisons between children who delayed entry and those who were retained, the multinomial regression model was run a second time using retained children as the reference group. These results are described in the right column of Table 3. Overall, results suggest many similarities between these two groups of children in terms of gender, age, FRL status, and school readiness skills. However, results indicate that White children had higher odds of delaying entry (and that Black and Latinx children were more likely to experience grade retention). Further, children who attended public school pre-K as opposed to center-based and family childcare had lower odds of being retained (i.e., were more likely to be in the delayed entry group).

Outcomes Associated with Different Kindergarten Progressions

To examine outcomes of children with different kindergarten progressions, I conducted a series of regression analyses. These analyses predicted performance in kindergarten, GPA, standardized reading, and standardized math in 3rd and 5th grade, and later (1st through 5th) grade retention.

Kindergarten

Table 4 describes the results of the regression predicting kindergarten performance. Boys, Black students, students who attended public school pre-K, students receiving free or reduced-price lunch, and children with disabilities tended to perform more poorly in kindergarten. Older children, children with stronger school readiness, and children who attended early childhood education during the VPK era performed better. As hypothesized, children who delayed entry and those who were retained in kindergarten outperformed their on-time peers in kindergarten (the second time through kindergarten for those who were retained). These results suggest that altered kindergarten progressions give children an initial boost in their academic performance. Delayed-entry students performed no differently than their retained peers.

3rd Grade

GPA. The left column of Table 5 describes 3rd grade GPA outcomes. Boys, children receiving free or reduced-price lunch, children with a disability, and children who were retained in a later grade (any grade before the 3rd-grade timepoint being analyzed) had poorer 3rd grade GPAs compared to their peers. White children, older children, post-VPK children, and children with better school readiness skills performed

better in 3rd grade compared to their peers. Both delayed-entry and kindergarten-retained students performed more poorly in 3rd grade compared to their on-time peers, suggesting that the initial boost experienced in kindergarten did not persist. The comparison between delayed entry and kindergarten-retained students was not statistically significant, as hypothesized.

Standardized Reading. The middle column of Table 5 describes 3rd-grade standardized reading outcomes. Black children, children receiving free or reduced-price lunch, children who attended public school pre-K, post-VPK children, children with a disability, and later-retained children had poorer 3rd grade reading outcomes compared to their peers. Boys, White children, ELL students, older children, and children with better school readiness skills performed better on the 3rd grade reading assessment compared to their peers. Both children who delayed school entry and those who were retained in kindergarten performed more poorly on this assessment compared to on-time students. As with GPA, there was no differences between delayed entry and retained students.

Standardized Math. The right column of Table 5 describes 3rd-grade standardized math outcomes. Black children, children receiving free or reduced-price lunch, children with a disability, and later-retained children had poorer 3rd grade math outcomes compared to their peers. Boys, ELL students, older children, post-VPK children, and children with better school readiness skills performed better on the 3rd grade math assessment compared to their peers. Similar to reading, both delayed entry and kindergarten-retained students performed more poorly on 3rd grade math compared to

their on-time peers. However, there was no difference in 3rd grade math outcomes for children who delayed entry compared to those who were retained, as hypothesized.

Reading and Retention in 3rd Grade. As an additional analysis, I examined the number of students in each progression category who failed the 3rd grade FCAT reading test, and how many of these students who failed were repeated 3rd grade. Among the students who took the 3rd grade reading standardized assessment, approximately 17% failed (received a 1). A score of 1 is considered the threshold for state-mandated retention. Proportionally more off-track students failed the standardized assessment compared to their typically progressing peers. While approximately 15.5% of on-time students failed the standardized reading test in 3rd grade, nearly half of delayed-entry and kindergarten-retained students failed this assessment (46.8% and 46.4%, respectively).

Among those who failed the standardized reading test in 3rd grade, only about 40% were actually retained in 3rd grade. Further, there were differences in retention rates among the kindergarten progressions. While approximately 42% of on-time children who failed the 3rd grade reading test were retained in grade, only about 28% of delayed-entry students and 24% of kindergarten-retained students were held back. This suggests that while children who experienced altered kindergarten progressions are more likely to fail the 3rd grade reading test required for promotion to the 4th grade, they are less likely to be retained on the basis of this test.

5th Grade

GPA. The left column of Table 6 describes 5th grade GPA outcomes. Boys, Black children, children receiving free or reduced-price lunch, children with a disability, and

later-retained children had poorer 5th grade GPAs compared to their peers. White children, older children, ELL students, and children with better school readiness skills performed better in 5th grade compared to their peers. Both children who delayed kindergarten entry and those who were retained in kindergarten performed more poorly in 5th grade compared to their on-time peers. The comparison between delayed entry and kindergarten-retained students was not statistically significant, as hypothesized.

Standardized Reading. The middle column of Table 6 describes 3rd grade standardized reading outcomes. Black children, children receiving free or reduced-price lunch, post-VPK children, children with a disability, and later-retained children had poorer 5th grade reading outcomes compared to their peers. White children, older children, ELL students, and children with better school readiness skills performed better on the 5th grade reading assessment compared to their peers. Both delayed-entry and kindergarten-retained students performed more poorly on 5th grade reading compared to on-time peers. As with GPA, there was no differences between delayed entry and kindergarten-retained students.

Standardized Math. The right column of Table 6 describes 5th grade standardized math outcomes. Black children, children receiving free or reduced-price lunch, children who attended public school pre-K, post-VPK students, children with a disability, and later-retained students had poorer 5th grade math outcomes compared to their peers. Boys, White children, older children, ELL students, and children with better school readiness skills performed better on the 5th grade math assessment compared to their peers. Both delayed-entry and kindergarten-retained students performed more

poorly on 5th grade math compared to their on-time peers. However, there was no difference in 5th grade math outcomes for children who delayed entry compared to those who were retained in kindergarten.

1st through 5th Grade Retention

Table 7 describes results of the logistic regression predicting later grade retention. Note that this model predicts grade retention after accounting for background and other school readiness variables. Table 1 provides unadjusted retention rates for each progression category, suggesting that children who delayed entry and who were retained in kindergarten have similar rates of later retention compared to their on-time peers. Children with better kindergarten performance, older children, and children with better school readiness skills had lower odds of being retained during 1st through 5th grade. Boys, post-VPK students, and children receiving free or reduced-price lunch had higher odds of being retained. As hypothesized, after accounting for covariates, children who delayed school entry and those who were retained in kindergarten had lower odds of being retained later in school. However, there was no difference between students who were retained in kindergarten and those who delayed entry on later grade retention.

Students with Disabilities

To examine the proportion of students with disabilities in each kindergarten progression category, I conducted a chi-square analysis. This analysis indicated that compared to students who entered school on-time, proportionally more children who delayed entry or were retained were later flagged as having a disability between kindergarten and 5th grade, $\chi^2(2) = 1,042.25, p < .000$. Specifically, 13% of on-time

children were flagged as having a disability, whereas 47.9% of children who delayed entry and 44.8% who were retained in kindergarten were considered to have a disability after school entry. Overall, approximately half of children with altered kindergarten progressions were later considered to have a disability between kindergarten and 5th grade.

Table 8 gives an overview of the types of disabilities children presented with in each kindergarten progression category. This breakdown uses the latest disability category a child received in elementary school. The overall chi-square test suggests that there are proportional differences in categories of disabilities among students with various kindergarten progressions, $\chi^2(12) = 117.38, p < .000$. Overall, there were few differences between disability categories for children who delayed entry or were retained. Proportionally more children who were retained in kindergarten had speech/language disorders compared to those who delayed entry, though this difference was not statistically significant. Further, slightly more children who delayed entry had other/health impairments compared to those who were retained in kindergarten, though again this difference was not statistically significant. Otherwise, disability proportions were similar between the two altered kindergarten progression groups.

Compared to on-time children, students with altered kindergarten progressions had proportionally more children with cognitive, and learning disabilities. Notably, the incidence of learning disabilities was high across all groups. However, there were proportionally more on-time children with speech/language disorders compared to those who experienced an altered kindergarten progression. Finally, proportionally more

children who entered school on-time were flagged as having other/health impairments compared to those who were retained in kindergarten.

Timing of Disability Identification

I also explored *when* students were first identified as receiving exceptional education services for a disability. This analysis just explored timing of services among students who were identified as having a disability sometime in elementary school ($n = 3,819$). Almost half (47%) of delayed-entry students who received services were identified during their first year in school. However, only about 28% of kindergarten-retained students who ended up receiving services at some point during elementary school were identified during their first year in school, and few (5 students, approximately 1%) received services the first time during their repeated kindergarten year. Approximately 38% of on-time students were identified for services in kindergarten. This suggests there is an initial delay in receiving services for students who are retained in kindergarten. Many (31%) of the kindergarten-retained students who received services at some point in elementary school were identified in 1st grade.

A chi-square analysis suggests the difference in the timing of receiving services is significant, $\chi^2(10) = 89.820, p < .000$. Figure 1 shows the grades at which children in each progression category were identified for disability services. Post-hoc comparisons indicate that proportionally more delayed-entry students with disabilities are identified for services in kindergarten compared to both on-time and kindergarten-retained students, and that more on-time students with disabilities are identified in kindergarten compared to those who are retained. Further, proportionally more kindergarten-retained students are

identified for services in 1st grade compared to both on-time and delayed-entry students. The only other grade in which there were significant differences is 3rd grade; in 3rd grade, proportionally more on-time students with disabilities were identified for exceptional education services compared to those who experienced an altered kindergarten progression. Examining the cumulative percentage in Figure 1, kindergarten-retained students are initially delayed in receiving education services but catch up with delayed-entrants in 1st grade. At this point, there is a lag in on-time entrants, many who are not identified for services until 3rd grade. Most students who receive disability services in elementary school first start receiving those services by 3rd grade.

Outcomes for Students with and without Disabilities

To examine whether academic outcomes vary for children with disabilities, I conducted the same series of regression linear regression analyses as above, but with the addition of interaction terms between disability status and kindergarten progression status. The following equation represents the models that were tested:

$$Y_i = B_0 + B_1 \text{Delayed Entry} + B_2 \text{Kindergarten Retained} + B_3 \text{Disabled} \\ + B_4 \text{Delayed Entry*Disabled} + B_5 \text{Kindergarten Retained*Disabled} + Z_i + e$$

Y_i represents the predicted outcome, and Z_i represents the child-level control variables. By including the interaction between altered kindergarten progressions and disability status, the estimate for the delayed-entry and kindergarten-retained indicators (B_1 and B_2 , respectively) now represent the difference in performance between on-time and off-track students *without* disabilities. The interaction terms (B_4 and B_5 , respectively) indicate whether the effect associated with altered kindergarten progressions differs for

children with disabilities. These interaction terms were the primary indicators of interest for these analyses. As with the previous models, to obtain comparisons between delayed-entry and retained students, I changed the reference group from on-time to retained students.

These analyses predicted performance in kindergarten, GPA, standardized reading, and standardized math in 3rd and 5th grade. Results for covariates and progression status were similar between the previous models and the models with the interaction terms, so the below results only describe key findings related to children's progression status and the interactions.

Kindergarten

Table 9 describes the results of the regression predicting kindergarten performance, with the addition of the interaction terms. Children who delayed entry and children who were retained in kindergarten outperformed their on-time peers in kindergarten (the second time through kindergarten for students who were retained). These results also suggest that delayed-entry students outperformed students who were retained in kindergarten. This suggests that students *without* disabilities who delayed entry outperformed kindergarten-retained students *without* disabilities. However, the interactions between disability status and progression status were not significant: children with disabilities who delayed entry performed similarly to children with disabilities who entered school on-time. Similarly, children with disabilities who were retained in kindergarten performed no differently than their on-time peers with disabilities. Overall, while these results indicate an overall positive effect for delayed-entry and retention in

kindergarten, they suggest no differential effects for students with disabilities. That is, children who delayed-entry or were retained in kindergarten performed better than their peers regardless of disability status.

3rd Grade

GPA. The left column of Table 10 describes the regression results predicting 3rd grade GPA, with the addition of the interaction terms. Children who delayed entry or who were retained in kindergarten performed more poorly on GPA compared to their on-time peers, though there were no differences in performance for students who delayed entry compared to those who were retained. As with kindergarten, the interaction terms were not significant. These findings suggest an overall negative effect of delayed entry and kindergarten retention in 3rd grade, but also suggest that findings do not vary by disability status.

Standardized Reading. The middle column of Table 10 describes the regression results predicting 3rd grade standardized reading, with the addition of the interaction terms. Children who delayed entry or who were retained in kindergarten performed more poorly on reading, though there were no differences in performance for students who delayed entry compared to those who were retained. As with the results for GPA, the interaction term between delayed-entry and disability status was not significant. This suggest that associations with delayed-entry status do not vary between children with and without a disability. However, the interaction term was significant for kindergarten retention and disability status. These findings suggest that the negative effect associated with being retained in kindergarten was stronger for children with disabilities in 3rd grade.

That is, the gap between kindergarten-retained students and on-time students for 3rd-grade reading was wider for children with disabilities compared to children without disabilities.

Standardized Math. The right column of Table 10 describes the regression results predicting 3rd grade math with the addition of the interaction terms. As a reminder, children who delayed entry or who were retained in kindergarten performed more poorly on math, though there were no differences in performance for students who delayed entry compared to those who were retained. As with the results for GPA and reading, the interaction terms were not significant. These findings suggest an overall negative effect of delayed entry and retention on 3rd grade reading, but also suggest that findings do not vary by disability status. As with the results for GPA, the interaction term between delayed-entry and disability status was not significant. This suggest that associations with delayed-entry status do not vary between children with and without a disability. However, the interaction term was significant for kindergarten retention and disability status. These findings suggest that the negative effect associated with being retained in kindergarten is stronger for children with disabilities in 3rd grade.

However, it is important to consider the significant interactions found in the models predicting 3rd grade reading and math. Though these interactions were statistically significant, suggesting that the effect of kindergarten retention was stronger for children with disabilities, it is likely that this is not a “true” effect but rather the result of grade retention. As noted above, children who were initially typically progressing were more likely than their peers to be retained in a later grade. Due to the standardized reading test and promotional gate in Florida, most later retention happens in 3rd grade. When children

repeat a grade, their test scores are generally higher for their repeated year compared to the first time the repeated the grade, and usually this “boost” disappears over time.

Considering these findings together, because initially on-time children are more likely to repeat 3rd grade, they are also more likely to experience a boost in test scores during their repeated 3rd grade year compared to initially retained students (who are more likely to only complete 3rd grade once), this may have artificially inflated the differences between these two groups of students. Importantly, this effect was only present in these “default” analyses using the second time children were in 3rd grade. As discussed in the method section, I analyzed both children’s first time through a grade and last time through a grade (using the repeated year for any student who was retained). As shown in Table A5 in the Appendix, the interaction terms were not significant when considering children’s first time through 3rd grade, further supporting the notion that these interactions may just be an artifact of the 3rd-grade repeaters. Finally, as noted below, the interaction effects are not significant in 5th grade (regardless of whether first- or second-time data are used). The fact that this effect does not persist may also suggest this is an anomalous finding.

5th Grade

GPA. The left column of Table 11 describes the findings for 5th grade GPA with the addition of the interaction terms. As before, both children who delayed entry and who were retained in kindergarten performed more poorly in 5th grade compared to their on-time peers, though there were no differences between students who delayed entry and those who were retained. Unlike in 3rd grade, however, no interaction terms were now significant.

Standardized Reading. The middle column of Table 11 describes the findings for 5th grade reading with the addition of the interaction terms. As before, both children who delayed entry and who were retained in kindergarten performed more poorly on 5th grade reading compared to their on-time peers, though there were no differences between students who delayed entry and those who were retained. As with kindergarten, the interaction terms were not significant. These findings suggest an overall negative effect of delayed entry and kindergarten retention in 5th grade, and do not vary by disability status.

Standardized Math. The right column of Table 11 describes the findings for 5th grade math with the addition of the interaction terms. Both children who delayed entry and those retained in kindergarten performed more poorly on 5th grade math compared to their on-time peers, and there were no differences between students who delayed entry and those who were retained. The interaction terms here were also not significant. These findings suggest the overall negative effect of delayed entry and kindergarten retention in 5th grade does not vary by disability status.

DISCUSSION

The goals of this dissertation were to a) better understand the predictors and outcomes associated with altered kindergarten progressions within a highly diverse sample, and b) explore whether these outcomes varied for students with disabilities. While there is a substantial body of literature surrounding delayed entry and retention, the current project is valuable for several reasons. First, this study explored its research questions within a large, ethnically diverse, predominantly low-income sample of children. Many previous studies tend to use less diverse, state or nationally representative samples. While such samples are clearly important for large-scale generalizability, the sample used in the current project is essential for understanding the experiences and best practices for children and families who come from more diverse, low-income communities. Second, this study directly compared delayed-entrants and kindergarten-retained students before and during elementary school, whereas most previous studies only compare these students to their typically progressing peers. Given that delayed entry happens more often for White, affluent children and that retention happens more often among less-affluent children of color, it is important to understand whether altering the kindergarten progression via delayed entry compared to kindergarten retention has different effects (i.e., more positive vs. negative). Finally, this study explored whether outcomes following altered kindergarten progressions vary for children with disabilities,

a relatively understudied question, but one that is gaining interest in this research community.

Predictors of Altered Progressions

Delayed Entry

The predictors of delayed entry in this study were relatively consistent with prior work. In this sample, White children had higher odds of delaying school entry compared to children of color, as did children who were relatively younger than their peers. These findings are consistent with general trends in the literature (Bassok & Reardon, 2013; Cosden et al., 1993; Fortner & Jenkins, 2017; Graue & DiPerna, 2000). However, contrary to prior work, there were no associations with poverty or gender. The typical delayed entrant is White, male, relatively younger than peers, and from an affluent background. Though these findings differ from previous work, they are not necessarily surprising. Considering poverty, this study used a predominantly low-income sample (79% receive free or reduced-price lunch); the limited variance of this factor likely contributed to the lack of an effect. In terms of gender, this study accounted for school readiness skills, which few studies are able to account for. Though the descriptive statistics (Table 1) do indicate that the delayed-entry group is comprised of more males, gender is not a significant predictor of delayed-entry status after accounting for other factors such as school readiness. It is possible that boys' actual or perceived poorer school readiness skills are what prompts their likelihood of delaying entry.

This study also found that ELLs had higher odds of delaying entry than their peers; this finding is unique to this context and has been found in studies using a similar

sample (Greenburg & Winsler, 2020; Winsler et al., 2012). Parents may prefer to enroll their children in school as early as possible if they are learning English in order to support the development of this language. If families speak a language other than English at home, ELL students will have better exposure to the English language within schools. Importantly, the timing of English language acquisition does matter. ELL students who acquire English proficiency earlier in their academic trajectories have more positive outcomes compared to children who become proficient later (Halle et al., 2012). Specifically, children who acquire English proficiency in kindergarten tend to perform similarly to their peers on math and reading over time, whereas children who acquire English proficiency later tend to lag behind (Halle et al., 2012)

Children who attended center-based childcare as opposed to public school pre-K had substantially lower odds of delaying entry. This suggests that once children are involved in the public school system, they are less likely to be removed from it in order to delay entry for a year, even if a child is performing more poorly than their peers on school readiness assessments. In general, however, children with poorer school readiness skills had higher odds of delaying entry compared to their peers.

Kindergarten Retention

Considering kindergarten retention, boys had higher odds of being retained compared to girls, as did children in poverty (those receiving free lunch in kindergarten). These patterns have been seen consistently across previous studies (Dauber et al., 1993; Davoudzadeh et al., 2015; Hong & Raudenbush, 2005; Huang, 2014; Mendez et al., 2015; Winsler et al., 2012). Part of these disparities may be related to challenges in the

transition to kindergarten. Recent work has noted that both boys and children in poverty tend to have more trouble than girls with the transition to kindergarten, struggling more with key competencies such as making friends, following schedules, and meeting academic demands (Jiang et al., 2021).

Similar to delayed entry, children who were relatively older than their peers had lower odds of being retained in kindergarten. This finding suggests that within a cohort, younger children are at increased risk to experience grade retention during their first year of formal schooling. It is possible that young children are perceived as less ready for school. Indeed, some research suggests that relatively younger children are rated by their teachers as having poorer cognitive and social skills compared to their peers (Janus & Duku, 2007). The higher likelihood of younger children being retained may also explain their higher propensity to be voluntarily held out of school for a year.

Children who attended public school pre-K as opposed to center-based childcare also had lower odds of being retained. This result might point to the better curricular alignment between pre-K and kindergarten for children who were already in the public school system and those who transitioned from a different setting. Recent research has pointed to large differences between curriculum and expectations in the preschool setting compared to the kindergarten setting (Rimm-Kaufman & Pianta, 2000). Such differences may be larger in a center-based pre-K program compared to a pre-K program that is housed within the public school (and in the same school the child is likely to attend when they transition to kindergarten).

Comparing Delayed-Entry Students and Kindergarten Retained Students

One of the important contributions of this study was examining the extent to which children who delayed entry and those who were retained in kindergarten differed from each other prior to school entry. This comparison has not been extensively explored but is important given that research tends to find that delayed entrants tend to be more advantaged compared to their on-time peers, whereas kindergarten-retained students tend to be more disadvantaged. Though prior research suggests that the differences between delayed entrants and kindergarten-retained students might be stark, this was not the case in the present study. Overall, delayed-entry students were similar to those who were retained in kindergarten. Both groups of children were struggling prior to school entry compared to on-time peers, but the results of this study do not suggest that one group was struggling more than the other. This was not surprising, however, given that the sample is predominantly composed of children who are at-risk prior to school entry.

Delayed-entry and kindergarten-retained children did differ on race, however, in that White children (compared to students of color) had over double the odds of delaying entry compared to being retained in kindergarten. This finding suggests that more White children may have had the opportunity to delay entry, whereas their peers were more likely to enter school on time and then subsequently be retained. This finding is similar to one of the few studies that has compared retained and delayed-entry children on baseline characteristics (Mendez et al., 2015). Though Mendez et al. (2015) also found disparities in socioeconomic status, where children who were retained were more likely to receive free or reduced-price lunch compared to delayed-entry students, that was not the case in

this study. As mentioned earlier, it is possible that the general lack of variance in terms of poverty precluded being able to detect a meaningful difference. Though the difference in FRL status was not significant, it did trend toward suggesting that children who receive free/reduced lunch had lower odds of delaying entry compared to being retained in kindergarten.

Outcomes Associated with Altered Kindergarten Progressions

Academic Achievement

Results of this project suggest that children who delay kindergarten entry or are retained in kindergarten experience an initial boost in performance (the second time through kindergarten for retained students) relative to their typically progressing peers. This advantage in kindergarten may have been slightly stronger for delayed entry students, considering the results examining whether effects are moderated for students with disabilities. However, by 3rd and 5th grade, children who experienced delayed entry or kindergarten retention were performing more poorly relative to their typically progressing peers across all academic outcomes (GPA, standardized reading, and standardized math). These performance differences are representative of the “struggle-succeed-struggle” trajectory for students who experience altered school progressions (Wu et al., 2010). Children who experience an altered kindergarten trajectory are struggling prior to school relative to their peers but experience a boost in performance upon entering school a year late for delayed-entry students, or repeating the kindergarten year for retained students. However, this advantage is not sustained past the kindergarten year and

students who experience an altered kindergarten progression actually experience poorer performance over time.

It is possible that for delayed entrants, this initial boost is related to entering school as a relatively older child who may be perceived as more competent by teachers. It has been established that teachers not only form expectations regarding their students based on characteristics such as ethnicity, social class, gender, and past achievement, but that these expectations may relate to student outcomes (Speybreock et al., 2012). Children who delay entry or are retained in kindergarten (and who are experiencing the curriculum for a second time) may also perceive themselves as more competent, thus improving academic performance. However, the positive effects of being relatively older than peers are not sustained and typically become negative over time.

For example, considering social/emotional outcomes, Wu et al. (2010) found that children who are retained in 1st grade show short-term increases in peer acceptance in school belonging, but that these effects did not last. In a study with similar students (Wu et al., 2008), researchers found that students who were retained in 1st grade also experienced similar academic declines over the same time period. It is well-established that children's social lives are entwined with their academic lives. It is possible that children's academic performance affects their social standing, or vice versa. For example, Gleason et al. (2007) found that retained 1st graders were more accepted by their peers due to teacher- and peer-perceived academic competence. Assuming the possibility that this relationship is bidirectional, if off-track children experience stigmatization and less acceptance from their peers, they may similarly experience negative academic outcomes.

Though children who are older than their peers may experience an initial advantage, they may experience more stigmatization as they age (Martin, 2010). It is possible that the label of “delayed-entrant” or “retainee” becomes more salient and negative with age, and this shift may happen even within elementary school (Wu et al., 2010).

Importantly, delayed-entry and retained students did not perform differently from each other in the later elementary grades. Rather, their performance was consistent until the end of elementary school. This suggests that delayed entry did not contribute to widening disparities between more advantaged children (who have higher odds of experiencing delayed entry) and less advantaged children (who have higher odds of being retained). These findings contrast with Mendez et al. (2015) who found that children who delayed entry had slightly better performance compared to retained peers. In the Mendez et al. study, delayed-entry students, however, performed no differently or slightly better than their on-time peers, whereas students in this sample performed more poorly. It is also important to note that there were few initial differences between the delayed-entry and retained groups within this sample. It is possible that in a less diverse sample, there may be more differences between delayed-entrants and retained students prior to school entry and also differences in performance over time.

Though kindergarten retention and delayed school entry are similar interventions in that they both aim to give children the “gift of time,” this “gift” may not be entirely equitable given the aforementioned differences in students who are retained in kindergarten compared to those who delay entry. This may be particularly true in contexts that are different from the one studied here. Though children who delay entry

often struggle prior to school entry, there is also evidence that typically- to high-performing students will be held out of school for a year, potentially to give children an advantage over their peers (Fortner & Jenkins, 2017). In the current context, however, the most developmentally at-risk children tended to be the ones who delayed entry into school (Greenburg & Winsler, 2020). These contextual differences may be important when considering how the current project differs from findings of previous research that finds positive outcomes associated with delayed entry (e.g., Fortner & Jenkins, 2017). It will be important for future studies to explore whether there are disparities in outcomes for delayed entry and retained students within different contexts where such interventions might be more inequitable compared to the current context.

Later Grade Retention

Though delayed-entry and retained students did perform more poorly academically over time, they had lower odds of being retained in 1st through 5th grade. This may suggest that the school system is loathe to retain a student who is already one year behind their same age peers. The lower odds of grade retention can be considered a positive outcome for students who experience altered kindergarten progression. Though retention in general is associated with negative outcomes, being held back in a later grade may be associated with even stronger negative effects such as school dropout (Jacob & Lefgren, 2009).

The differences in later retention rates were particularly stark for 3rd grade when children take a standardized reading test required for promotion. Given this promotional gate, a great deal of later retention happens in this grade. Of the students who took the

reading test in 3rd grade, nearly half of students who experienced an altered kindergarten progression failed this test (which would theoretically result in mandatory retention) compared to only 15.5% of on-time students. This analysis did not adjust for background characteristics, however, so the high rates of failure are not necessarily surprising given that these children had more academic challenges prior to entering school. Of the students who failed the reading test, only 40% were retained. This is consistent with prior work in this community. Among a similar sample of diverse students, only about 53% of students who failed the 3rd grade reading test were retained; of the students who failed, only about 35% appeared to qualify for an exemption from the mandatory retention policy (Tavassolie & Winsler, 2019).

Additionally, there are stark differences among who gets retained after failing this test. Approximately 42% of on-time students were retained after failing the reading test, compared to 28 and 24% of delayed-entry and retained students, respectively. This suggests that while students who experience altered kindergarten progression are more likely to fail the reading test required for promotion, they are less likely to be retained on the basis of it. Such a finding is important to consider in a high-stakes testing context. Though children generally do not take high-stakes tests until 3rd grade, parents may consider early on what they can do (e.g., altering the school progression early) to avoid their child failing/being retained later on. It is also possible that children who experience altered school progressions are more likely to qualify for an exemption, such as having an IEP, that would allow them to be promoted despite failing the FCAT. It is also possible that the school system is hesitant to hold off-track children even farther behind their

peers, though is important to note that Florida's state policy only exempts students from mandatory retention if they have been retained *twice* prior to third grade (Florida Department of Education, 2020).

Considering Children with Disabilities

As expected, there were higher proportions of children with disabilities who experienced altered kindergarten progressions. This study excluded children who were identified as having a disability *before* entering the school system (those who attended pre-K specifically for children with disabilities and were already receiving services from the school system). Notably, previous research using a similar sample found that these children did not delay entry at higher rates compared to their peers (Greenburg & Winsler, 2020). In the current sample, approximately half of delayed-entry and kindergarten-retained students were identified as having a disability sometime during elementary school compared to 13% of typically progressing students. Children with cognitive and specific learning disabilities were particularly likely to experience delayed-entry or kindergarten retention. This finding is important given that some research has found that children with learning disabilities may be disadvantaged from being held out of school for a year rather than entering school on time (Fortner & Jenkins, 2018). Children with speech/language disabilities, however, were more likely to enter school on-time as opposed to experiencing an altered kindergarten progression.

Timing of Receiving Disability Services

I also explored *when* children who were identified as having a disability in elementary school first received services from the school system. There were several

notable patterns. First, most students with disabilities in the on-time and delayed-entry group were identified for services during kindergarten. Proportionally more delayed-entry students were identified for services in their first year compared to on-time students. Nearly 50% of delayed-entry students with a disability first received services during kindergarten compared to about 40% of on-time students. However, only about 30% of students with disabilities who experienced kindergarten retention first receive services during their kindergarten year (their first OR second time through the grade level). Another 30% of these students began receiving services during their 1st grade year, at least two years after they entered the school system. Initially on-time students also experienced another spike in disability identification in 3rd grade; an additional 20% of these students first received services in 3rd grade, compared to 8 and 14% for delayed-entry and kindergarten-retained students.

Overall, this suggests that most students who are identified as having a disability in elementary school first begin receiving services by the 3rd grade. By 3rd grade, about 88-90% of students with disabilities are receiving services. However, there is an initial delay in receiving services for students who are retained in kindergarten, with most students not being identified until after they experience the retention. A substantial proportion of these students are identified in the 1st grade, though, meaning they still receive services relatively early in their schooling. The receipt of special education services for retained students is an understudied area, and one that warrants further consideration. One study found that among retained students (kindergarten or 1st grade) with persistent academic difficulties (who may have been qualified to receive special

education services), most never received services from the school (Silverstein et al., 2009). This raises the question about whether students who experience grade retention are receiving timely access to appropriate accommodations and services.

Outcomes for Children with Disabilities

Another important contribution of this project was to explore whether outcomes following altered kindergarten progressions differed for children with disabilities. This is a relatively understudied topic that has begun to receive more attention in the literature, particularly for delayed entry (Fortner & Jenkins, 2017; 2018). However, there is still a dearth of research regarding students with disabilities who are retained. Though this project represents an important step in the study of academic outcomes for students with disabilities for students who experience altered school progressions, more work is needed in this area.

Overall, the results indicated that there were no differences in academic performance following altered kindergarten progressions for children with disabilities. That is, altering the kindergarten progression did not appear to harm or benefit children with disabilities any more than typically developing children. These findings contrast with other literature, such as Fortner & Jenkins (2017, 2018) who found that delaying entry was more harmful for children with disabilities. There are a few reasons the findings in this project might differ. First, there was an overall negative effect of delayed entry for this sample, whereas others have found an overall positive effect. Because children who experienced altered school progressions were already performing more poorly compared to their peers, having a disability, though associated with poorer

performance generally, may not have been additionally detrimental. I was also able to account for children's school readiness skills prior to school entry. Assuming children with disabilities struggle more prior to school entry, it is possible that controlling for the effect of school readiness accounted for differences others have found when exploring the effects of altered progressions for children with disabilities. For example, Fortner and Jenkins (2017) controlled for a variety of factors such as giftedness, retention, disability status, and English proficiency but did not have an indicator of academic/social competence prior to school entry. Another project using a similar sample to the one used here did *not* account for prior school readiness when exploring outcomes for children with disabilities who delayed entry and *did* find slightly more negative effects for these children (Greenburg & Winsler, 2021). This suggests accounting for school entry skills is important when considering later academic outcomes.

Limitations

Despite the strengths of this study, it should be considered in light of its limitations. First, the use of solely quantitative, administrative-level data precludes understanding *why* certain decisions were made to delay a child's entry into school or to retain them in kindergarten. These data reflect whether a student experienced and altered kindergarten progression, but not the reasoning behind it. Additionally, these data only reflect students' academic achievement. As discussed above, social/emotional factors likely play an important for children who experience an altered school trajectory, particularly for students who are held out of school or repeated kindergarten due to

perceived emotional immaturity. Such factors may be important as both outcomes and moderators of children's later success.

Further, despite the large sample size used in the present study, the delayed-entry subgroup was quite small. Out of the current sample, only about 1% of students delayed entry into kindergarten. Such a small subgroup makes it harder from a statistical standpoint to elicit meaningful comparisons, particularly when examining interactions. Because the delayed-entry group was small, the cell sizes were even smaller when examining delayed-entry students with disabilities.

Finally, this study is limited in terms of generalizability. Though the diversity of the current sample is a strength, its findings are not widely generalizable. While the sample used in this study is representative of Miami-Dade County, Florida, it is not representative of the rest of the state. It is likely that results of this project would differ if conducted using a different, more nationally representative sample given the unique context of the current project. However, as mentioned before, this project provides an important step in understanding experiences within a more focused community context.

Future Directions

There is a great deal more work than can and should be done in this realm. First, more research should be conducted on the decision-making processes surrounding delayed entry and kindergarten retention. Though research has been able to find significant correlates of delaying entry and being retained, less is known about particular reasons parents choose to delay entry for their child or what set of factors teachers consider when recommending a child for retention. Given the stark racial lines between

White children and Latinx and Black children in terms predictors of delayed entry, it will be important to explore whether families are treated differently by the school system as well as how factors such as parental knowledge/education might impact these decisions. Though this is not possible with the present data, future research should qualitatively explore whether decisions regarding delayed entry stem from school recommendations or are solely made within the family. Even in a highly diverse population such as Miami where non-Hispanic White individuals are the minority, there still seem to be key racial differences in terms of the opportunities (i.e., delayed entry) children have prior to school entry. Given these structural racial differences, it will also be important in the future to consider race as a potential moderator for outcomes associated with altered school progressions.

It will also be important to more closely examine the trajectories of children who experience altered kindergarten progressions. The current study only examined outcomes at three timepoints: kindergarten, 3rd grade, and 5th grade. Within this sample, there was a shift between kindergarten and 3rd grade where off-track students, who initially experienced a boost in their performance (i.e., outperform on-time peers in kindergarten), began performing more poorly by 3rd grade. Future work should examine *when* between these two timepoints the shift occurs. Understanding whether the shift occurs earlier (e.g., in 1st or 2nd grade) or whether 3rd grade is the point at which off-track children perform more poorly may be important for understanding why this shift occurs. For example, if the shift does not occur until 3rd grade, it may suggest something structural related to the pressures associated with the 3rd grade year in this school system. However, if the shift

occurs earlier, it may be related to shifting peer and teacher relations and expectations, as discussed above, that children who experience altered kindergarten progressions may experience.

Implications for Practice

The results of this project suggest that, in this sample, delaying kindergarten entry or retaining a child in kindergarten is not associated with long-term achievement benefits and may actually be harmful for children in the long-term. While there are likely individual instances where delayed entry or retention might be the best option for an individual child, delayed entry and kindergarten retention should not be recommended to families who are concerned about their child's academic success. Rather, other ways for supporting children as they transition into formal schooling should be considered. For example, considering that both delayed entry and retention are motivated by children struggling adapting to the kindergarten environment, more focus should be placed on alignment between the pre-K and kindergarten curriculum. Some school districts have begun to consider more ways to promote such alignment (McCormick et al., 2020). On a larger scale, more attention on the rigor of kindergarten is warranted to ensure developmental appropriateness (Jiang et al., 2021). In recent years, the kindergarten curriculum has become more academically demanding, which may promote additional challenges in this transition (Bassok et al., 2016).

This study also has important implications for considering best practices for children with disabilities. It is a positive finding that children with disabilities in this sample were not harmed more than their typically developing peers by delaying entry or

being retained in kindergarten. However, parents, teachers, and other stakeholders in children's success should consider access and equity to services when making decisions about delaying entry or retaining a child in grade. Unless a child already has high-quality support within the home or another childcare arrangement, it may be more beneficial for children with disabilities to be enrolled in school as soon as possible in order to be able to access services offered by the school. It is possible that delaying a child's entry into kindergarten will keep them out of the context where they can receive high-quality support (Carlton & Winsler, 1999). Further, considering children who are retained in kindergarten, practices surrounding identification and receipt of disability services should be explored. As discussed above, children who experience retention may be identified later for disability services than their peers. Even though having a disability and being retained does not appear to be inordinately harmful for children, this is still an important issue to consider. Future work should continue to explore the extent to which altered school progressions affect children with disabilities.

TABLES

Table 1 Sample Descriptive Statistics

Variable	Total Sample	On-Time	Delayed-Entry	K Retained
<i>N</i> (%)	26,207 (100%)	24,919 (95.1%)	284 (1.1%)	1,004 (3.8%)
Gender***				
Male	13,221 (50.4%)	12,382 (49.7%) _a	186 (65.5%) _b	653 (65.0%) _b
Female	12,986 (49.6%)	12,537 (50.3%) _a	98 (34.5%) _b	351 (35.0%) _b
Ethnicity***				
White/Asian/Other	1,941 (7.4%)	1,894 (7.6%) _a	16 (5.6%) _{a,b}	31 (3.1%) _b
Latinx	14,997 (57.2%)	14,325 (57.5%) _a	144 (50.7%) _{a,b}	528 (52.6%) _b
Black	9,269 (35.4%)	8,700 (34.9%) _a	124 (43.7%) _b	445 (44.3%) _b
FRL Status in Kindergarten***				
No FRL	5,506 (21%)	5,393 (21.6%) _a	27 (9.5%) _b	86 (8.6%) _b
Reduced-Price Lunch	2,995 (11.4%)	2,921 (11.7%) _a	19 (6.7%) _b	55 (5.5%) _b
Free Lunch	17,706 (67.6%)	16,605 (66.6%) _a	238 (83.8%) _b	863 (86.0%) _b
ELL Status**				
Non-ELL	11,412 (43.5%)	10,801 (43.3%) _a	147 (51.8%) _b	464 (46.2%) _{a,b}
ELL	14,795 (56.5%)	14,118 (56.7%) _a	137 (48.2%) _b	540 (53.8%) _{a,b}
Center Type***				
Center-Based Care	7,949 (32.1%)	7,312 (30.9%) _a	163 (84.0%) _b	474 (50.9%) _c
Public School Pre-K	16,818 (67.9%)	16,330 (69.1%) _a	31 (16.0%) _b	457 (49.1%) _c
Disability Status K-5 th ***				
No Disability	22,388 (85.4%)	21,686 (87.0%) _a	148 (52.1%) _b	554 (55.2%) _b

Disability	3,819 (14.6%)	3,233 (13.0%) _a	136 (47.9%) _b	450 (44.8%) _b
Ever Retained 1 st -5 th				
No	21,994 (86.6%)	20,984 (86.6%) _a	216 (84.7%) _a	794 (85.8%) _a
Yes	3,413 (13.4%)	3,243 (13.4%) _a	39 (15.3%) _a	131 (14.2%) _a
<i>M (SD)</i>				
Relative Age***	6.65 (3.50)	6.72 (3.49) _a	4.99 (3.31) _b	5.18 (3.37) _b
Pre-Academic Skills***	51.75 (26.25)	53.14 (25.84) _a	27.32 (21.22) _b	26.19 (19.62) _b
Parent Behavior Concerns***	66.69 (29.24)	66.24 (29.29) _a	80.24 (23.54) _b	75.84 (27.13) _b
Parent Protective Factors***	51.35 (30.98)	51.99 (30.83) _a	35.41 (29.03) _b	37.79 (31.55) _b
Teacher Behavior Concerns***	45.65 (29.58)	44.70 (29.39) _a	70.50 (23.48) _b	64.11 (27.05) _c
Teacher Protective Factors***	59.34 (28.15)	60.26 (27.86) _a	37.30 (25.14) _b	41.04 (27.67) _b
Kindergarten Performance***	2.44 (0.43)	2.44 (0.43) _a	2.51 (0.47) _b	2.31 (0.43) _c
3 rd Grade GPA***	4.07 (0.50)	4.10 (0.58) _a	3.58 (0.65) _b	3.52 (0.64) _b
3 rd Grade Reading***	3.07 (1.12)	3.11 (1.10) _a	2.15 (1.11) _b	2.10 (1.08) _b
3 rd Grade Math***	3.25 (1.10)	3.29 (1.08) _a	2.38 (1.15) _b	2.29 (1.09) _b
5 th Grade GPA***	4.10 (0.58)	4.13 (0.57) _a	3.62 (0.66) _b	3.58 (0.61) _b
5 th Grade Reading***	2.90 (1.16)	2.95 (1.15) _a	1.99 (0.99) _b	1.98 (1.02) _b
5 th Grade Math***	2.86 (1.19)	2.91 (1.18) _a	1.89 (1.06) _b	1.86 (0.97) _b

* $p < .05$, ** $p < .01$, *** $p < .001$ based on chi-square and ANOVAs; subscripts denote whether groups differ from each other at the .05 level, adjusted for multiple comparisons using Bonferroni. The same subscript indicates categories that do *not* differ from each other.

Note. Center Type and Ever Retained sum to smaller than the total sample due to missing data and attrition. School readiness scores and 3rd/5th grade outcomes use just students with available data. Kindergarten Performance for retained students is their *second* time through kindergarten.

Table 2 Categories of Disability Statuses (Overall Sample)

Category	% of Children with Disabilities	School System Designation
Cognitive	2.5%	Intellectual Disabilities Traumatic Brain Injured
Physical/Sensory	1.0%	Orthopedically Impaired Deaf or Hard of Hearing Visually Impaired Dual-Sensory Impaired
Psychological	12.4%	Autistic Emotionally Handicapped Severely Emotionally Disturbed
Learning	49.9%	Specific Learning Disabled
Speech/Language	24.2%	Speech Impaired Language Impaired
Developmental Delay	0.3%	Developmentally Delayed
Other/Health Impaired	9.7%	Other Health Impaired Hospital/Homebound

Table 3 Predictors of Kindergarten Progressions

Variable	Delayed Entry vs. On-Time		Retained in Kindergarten vs. On-Time		Delayed Entry vs. Retained in Kindergarten	
	Odds Ratio	95% CI [LL, UL]	Odds Ratio	95% CI [LL, UL]	Odds Ratio	95% CI [LL, UL]
Male	1.166	[0.936, 1.454]	1.232**	[1.090, 1.392]	0.946	[0.741, 1.209]
White vs. Latinx	2.627**	[1.518, 4.546]	0.990	[0.709, 1.383]	2.653*	[1.414, 4.979]
Black vs. Latinx	0.864	[0.655, 1.140]	0.896	[0.762, 1.053]	0.965	[0.710, 1.130]
White vs. Black	3.040***	[1.838, 5.029]	1.105	[0.787, 1.552]	2.750**	[1.519, 4.979]
Reduced-Price Lunch in K	0.807	[0.480, 1.357]	0.819	[0.607, 1.105]	0.986	[0.549, 1.771]
Free Lunch in K	1.092	[0.757, 1.576]	1.590***	[1.289, 1.960]	0.687	[0.454, 1.040]
ELL	0.671*	[0.512, 0.879]	0.842	[0.721, 0.985]	0.796	[0.591, 1.073]
Relative Age	0.868***	[0.842, 0.895]	0.869***	[0.855, 0.884]	0.999	[0.966, 1.033]
Public School Pre-K	0.137***	[0.096, 0.194]	0.798**	[0.705, 0.902]	0.171***	[0.118, 0.248]
Pre-Academic Skills	0.969***	[0.962, 0.977]	0.961***	[0.957, 0.964]	1.009	[1.001, 1.017]
Parent BC	1.007	[1.001, 1.013]	1.002	[0.999, 1.004]	1.005	[0.998, 1.011]
Parent TPF	0.994*	[0.989, 0.998]	0.995***	[0.992, 0.997]	0.999	[0.994, 1.004]
Teacher BC	1.010*	[1.004, 1.015]	1.007***	[1.004, 1.010]	1.003	[0.997, 1.009]
Teacher TPF	0.990*	[0.985, 0.995]	0.995**	[0.993, 0.998]	0.995	[0.989, 1.000]

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

Note. All 3 ethnicity contrasts were obtained by running the model a second time and changing the reference group because each is of interest. BC = Behavior Concerns, TPF = Total Protective Factors.

Table 4 Predictors of Kindergarten Performance

Variable	<i>B</i>	β	<i>SE (B)</i>
Delayed Entry vs. On-Time	0.169***	0.040	0.028
Retained in K vs. On-Time	0.111***	0.049	0.017
Delayed Entry vs. Retained in K	0.058	0.011	0.033
Male	-0.043***	-0.050	0.006
White vs. Latinx	0.017	0.011	0.018
Black vs. Latinx	-0.058***	-0.064	0.016
White vs. Black	0.075**	0.045	0.022
ELL	0.000	0.000	0.011
Relative Age	0.015***	0.122	0.001
Public School Pre-K	-0.079**	-0.086	0.011
Pre-Academic Skills	0.004***	0.251	0.000
Parent BC	0.000***	-0.024	0.000
Parent TPF	0.001***	0.055	0.000
Teacher BC	-0.001***	-0.072	0.000
Teacher TPF	0.001**	0.045	0.000
Post-VPK	0.263***	0.292	0.012
Reduced-Price Lunch in K	-0.039*	-0.028	0.016
Free Lunch in K	-0.086***	-0.093	0.014
Has Disability in K	-0.090***	-0.050	0.011
Constant	2.176***	--	0.029

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

Note. Multiple comparisons for kindergarten progression and ethnicity obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors.

Table 5 Predictors of 3rd Grade GPA, Reading, and Math

Variable	GPA			Reading			Math		
	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)
Delayed Entry vs. On-Time	-0.187***	-0.031	0.041	-0.263***	-0.023	0.072	-0.398***	-0.035	0.070
Retained in K vs. On-Time	-0.200***	-0.063	0.023	-0.386***	-0.064	0.037	-0.364***	-0.061	0.036
Delayed Entry vs. Retained in K	0.013	0.002	0.047	0.123	0.011	0.079	-0.034	-0.003	0.073
Male	-0.109***	-0.092	0.007	0.049***	0.022	0.013	0.193***	0.088	0.014
White vs. Latinx	0.090***	0.040	0.016	0.155***	0.036	0.027	0.147***	0.035	0.027
Black vs. Latinx	-0.182***	-0.147	0.018	-0.279***	-0.118	0.025	-0.288***	-0.124	0.026
White vs. Black	0.272***	0.121	0.020	0.434***	0.101	0.031	0.436***	0.103	0.030
ELL	0.021	0.017	0.011	0.056**	0.025	0.019	0.094***	0.042	0.021
Relative Age	0.015***	0.090	0.001	0.032***	0.099	0.002	0.034***	0.107	0.002
Public School Pre-K	-0.004	-0.003	0.011	-0.021	-0.009	0.018	-0.026	-0.011	0.018
Pre-Academic Skills	0.006***	0.248	0.000	0.012***	0.278	0.000	0.012***	0.291	0.000
Parent BC	-0.001***	-0.032	0.000	-0.001**	-0.021	0.000	-0.001**	-0.014	0.000
Parent TPF	0.001***	0.051	0.000	0.002***	0.053	0.000	0.002***	0.055	0.000
Teacher BC	-0.002***	-0.093	0.000	-0.002***	-0.053	0.000	-0.002***	-0.046	0.000
Teacher TPF	0.001**	0.027	0.000	0.000	0.008	0.000	0.001**	0.024	0.000
Post-VPK	0.081***	0.066	0.010	-0.105***	-0.045	0.017	0.214**	0.093	0.017
Reduced-Price Lunch in G3	-0.083***	-0.045	0.013	-0.100***	-0.029	0.024	-0.076***	-0.022	0.024
Free Lunch in G3	-0.188***	-0.149	0.012	-0.249***	-0.104	0.020	-0.219***	-0.093	0.020
Has Disability in G3	-0.150***	-0.080	0.015	-0.479***	-0.134	0.025	-0.378***	-0.107	0.028
Retained G1-G3	-0.185***	-0.106	0.014	-0.411***	-0.125	0.022	-0.314***	-0.097	0.023
Constant	3.982***	--	0.032	2.651***	--	0.054	2.485***	--	0.056

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

Note. Multiple comparisons for kindergarten progression and ethnicity obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors.

Table 6 Predictors of 5th Grade GPA, Reading, and Math

Variable	GPA			Reading			Math		
	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)
Delayed Entry vs. On-Time	-0.149***	-0.025	0.041	-0.223**	-0.019	0.065	-0.271***	-0.022	0.078
Retained in K vs. On-Time	-0.211***	-0.065	0.022	-0.328***	-0.051	0.039	-0.405***	-0.061	0.038
Delayed Entry vs. Retained in K	0.061	0.010	0.045	0.105	0.009	0.073	0.134	0.011	0.086
Male	-0.147***	-0.126	0.007	0.006	0.003	0.014	0.236***	0.098	0.015
White vs. Latinx	0.092***	0.042	0.018	0.185***	0.042	0.030	0.204***	0.045	0.034
Black vs. Latinx	-0.191***	-0.155	0.018	-0.363***	-0.158	0.028	-0.332***	-0.131	0.033
White vs. Black	0.283***	0.127	0.022	0.548***	0.124	0.032	0.537***	0.117	0.036
ELL	0.040***	0.034	0.011	0.071**	0.030	0.021	0.142***	0.059	0.023
Relative Age	0.009***	0.052	0.001	0.027***	0.082	0.002	0.027***	0.078	0.002
Public School Pre-K	-0.006	-0.005	0.010	-0.026	-0.010	0.017	-0.061*	-0.024	0.018
Pre-Academic Skills	0.005***	0.204	0.000	0.010***	0.227	0.000	0.014***	0.307	0.000
Parent BC	-0.001***	-0.039	0.000	-0.001**	-0.019	0.000	-0.001*	-0.016	0.000
Parent TPF	0.001***	0.051	0.000	0.002***	0.062	0.000	0.002***	0.048	0.000
Teacher BC	-0.002***	-0.086	0.000	-0.002***	-0.047	0.000	-0.002***	-0.055	0.000
Teacher TPF	0.001***	0.034	0.000	0.000	0.012	0.000	0.000	0.007	0.000
Post-VPK	-0.001	-0.001	0.009	-0.062***	-0.026	0.016	-0.148***	-0.059	0.020
Reduced-Price Lunch	-0.106***	-0.053	0.013	-0.173***	-0.044	0.029	-0.177***	-0.043	0.031
Free Lunch	-0.201***	-0.158	0.012	-0.344***	-0.135	0.021	-0.306***	-0.117	0.025
Has Disability in G5	-0.150***	-0.081	0.016	-0.507***	-0.138	0.028	-0.412***	-0.109	0.028
Retained G1-G5	-0.267***	-0.154	0.014	-0.572***	-0.165	0.022	-0.447***	-0.125	0.022
Constant	4.168***	--	0.026	2.685***	--	0.053	2.317***	--	0.059

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

Note. Multiple comparisons for kindergarten progression and ethnicity obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors.

Table 7 Predictors of Later Grade Retention

Variable	Odds Ratio	95% CI [LL, UL]
Delayed Entry vs. On-Time	0.407***	[0.273, 0.609]
Retained in K vs. On-Time	0.347***	[0.282, 0.429]
Delayed Entry vs. Retained in K	1.173	[0.746, 1.844]
Kindergarten Performance	0.262***	[0.235, 0.293]
Male	1.166***	[1.086, 1.251]
White vs. Latinx	0.921	[0.758, 1.119]
Black vs. Latinx	1.116	[0.982, 1.290]
White vs. Black	0.818	[0.670, 0.999]
ELL	0.957	[0.853, 1.073]
Relative Age	0.943***	[0.933, 0.953]
Public School Pre-K	0.852**	[0.778, 0.932]
Pre-Academic Skills	0.973***	[0.971, 0.976]
Parent BC	1.003**	[1.001, 1.004]
Parent TPF	0.996***	[0.994, 0.997]
Teacher BC	1.004***	[1.003, 1.006]
Teacher TPF	0.997**	[0.995, 0.999]
Post-VPK	1.307***	[1.204, 1.418]
Reduced-Price Lunch in K	1.361**	[1.135, 1.633]
Free Lunch in K	2.025***	[1.743, 2.352]
Has Disability in K	0.870	[0.753, 1.004]

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

Note. Multiple comparisons for kindergarten progression and ethnicity obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors.

Table 8 Disability Categories by Kindergarten Progression

	Total	On-Time	Delayed Entry	Kindergarten Retained
Disability Category				
Cognitive	97 (2.5%)	65 (2.0%) _a	10 (7.4%) _b	22 (4.9%) _b
Physical/Sensory	38 (1.0%)	30 (0.9%) _a	2 (1.5%) _a	6 (1.3%) _a
Psychological	474 (12.4%)	386 (11.9%) _a	19 (14.0%) _a	69 (14.6%) _a
Learning	1,908 (49.9%)	1,548 (47.9%) _a	85 (62.5%) _b	275 (61.1%) _b
Speech/Language	923 (24.2%)	867 (26.8%) _a	8 (5.9%) _b	48 (10.7%) _b
Developmental Delay	10 (0.3%)	9 (0.3%) _a	0 (0.0%) _a	1 (0.2%) _a
Other/Health Impaired	371 (9.7%)	330 (10.2%) _a	12 (8.8%) _{a, b}	29 (6.4%) _b

Note. The same subscript denotes a subset of kindergarten progression contrasts whose column proportions do *not* differ from each other at the .05 level; adjusted for multiple comparisons using Bonferroni.

Table 9 Kindergarten Performance Outcomes with Interactions between Kindergarten Progression and Disability Status

Variable	<i>B</i>	β	<i>SE (B)</i>
Delayed Entry vs. On-Time	0.180***	0.043	0.029
Retained in K vs. On-Time	0.111***	0.049	0.018
Delayed Entry vs. Retained in K	0.069*	0.017	0.035
Has Disability in K	-0.088***	-0.049	0.013
DE*Disability vs. OT	-0.051	-0.006	0.062
RET*Disability vs. OT	-0.001	0.000	0.033
DE*Disability vs. RET	-0.050	-0.006	0.068
Male	-0.043***	-0.050	0.006
White vs. Latinx	0.017	0.010	0.018
Black vs. Latinx	-0.058***	-0.064	0.016
White vs. Black	0.075**	0.045	0.022
ELL	0.000	0.000	0.011
Relative Age	0.015***	0.1233	0.001
Public School Pre-K	-0.079**	-0.086	0.011
Pre-Academic Skills	0.004***	0.251	0.000
Parent BC	0.000***	-0.024	0.000
Parent TPF	0.001***	0.055	0.000
Teacher BC	-0.001***	-0.072	0.000
Teacher TPF	0.001**	0.045	0.000
Post-VPK	0.263***	0.292	0.012
Reduced-Price Lunch	-0.039*	-0.029	0.016
Free Lunch	-0.086***	-0.093	0.014
Constant	2.176***	--	0.029

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

Note. Multiple comparisons obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors, DE = delayed entry, RET = kindergarten retained, OT = on-time.

Table 10 3rd Grade GPA, Reading, and Math Outcomes with Interactions between Kindergarten Progression and Disability Status

Variable	GPA			Reading			Math		
	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)
Delayed Entry vs. On-Time	-0.195***	-0.032	0.055	-0.208*	-0.018	0.086	-0.323***	-0.028	0.089
Retained in K vs. On-Time	-0.182***	-0.057	0.027	-0.323***	-0.053	0.048	-0.276***	-0.046	0.046
Delayed Entry vs. Retained in K	-0.012	-0.002	0.061	0.115	0.010	0.099	-0.048	-0.004	0.094
Has Disability in G3	-0.145***	-0.077	0.015	-0.456***	-0.128	0.027	-0.345***	-0.098	0.030
DE*Disability vs. OT	0.015	0.002	0.097	-0.161	-0.009	0.139	-0.218	-0.012	0.164
RET*Disability vs. OT	-0.051	-0.010	0.046	-0.190*	-0.020	0.086	-0.266**	-0.028	0.085
DE*Disability vs. RET	0.066	0.007	0.101	0.029	0.002	0.156	0.048	0.003	0.169
Male	-0.109***	-0.092	0.007	0.049***	0.022	0.013	0.193***	0.087	0.014
White vs. Latinx	0.090***	0.040	0.016	0.155***	0.036	0.027	0.148***	0.035	0.027
Black vs. Latinx	-0.182***	-0.147	0.018	-0.279***	-0.118	0.025	0.288***	-0.124	0.026
White vs. Black	0.272***	0.121	0.020	0.434***	0.101	0.031	0.436***	0.103	0.030
ELL	0.021	0.017	0.011	0.056**	0.025	0.019	0.094***	0.042	0.021
Relative Age	0.015***	0.090	0.001	0.032***	0.099	0.002	0.034***	0.107	0.002
Public School Pre-K	-0.004	-0.004	0.011	-0.021	-0.009	0.018	-0.026	-0.011	0.018
Pre-Academic Skills	0.006***	0.248	0.000	0.012***	0.278	0.000	0.012***	0.291	0.000
Parent BC	-0.001***	-0.032	0.000	-0.001**	-0.021	0.000	-0.001*	-0.014	0.000
Parent TPF	0.001***	0.051	0.000	0.002***	0.053	0.000	0.002***	0.051	0.000
Teacher BC	-0.002***	-0.093	0.000	-0.002***	-0.053	0.000	-0.002***	-0.046	0.000
Teacher TPF	0.001**	0.027	0.000	0.000	0.008	0.000	0.001**	0.024	0.000
Post-VPK	0.081***	0.066	0.010	-0.105***	-0.045	0.017	0.214***	0.093	0.017
Reduced-Price Lunch in G3	-0.083***	-0.045	0.013	-0.100***	-0.029	0.024	-0.075**	-0.022	0.024
Free Lunch in G3	-0.189***	-0.149	0.012	-0.249***	-0.104	0.020	-0.219***	-0.093	0.020
Retained G1-G3	-0.187***	-0.107	0.014	-0.419***	-0.127	0.022	-0.325***	-0.100	0.023
Constant	3.982***	--	0.032	2.649	--	0.054	2.483***	--	0.056

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

Note. Multiple comparisons obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors, DE = delayed entry, RET = kindergarten retained, OT = on-time.

Table 11 5th Grade GPA, Reading, and Math Outcomes with Interactions between Kindergarten Progression and Disability Status

Variable	GPA			Reading			Math		
	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)
Delayed Entry vs. On-Time	-0.164**	-0.027	0.048	-0.186*	-0.015	0.088	-0.235*	-0.019	0.103
Retained in K vs. On-Time	-0.230***	-0.071	0.032	-0.331***	-0.051	0.050	-0.447***	-0.067	0.049
Delayed Entry vs. Retained in K	0.065	0.011	0.056	0.145	0.012	0.098	0.212	0.017	0.112
Has Disability in G5	-0.156***	-0.085	0.016	-0.505***	-0.137	0.030	-0.421***	-0.111	0.032
DE*Disability vs. OT	0.044	0.004	0.086	-0.081	-0.005	0.138	-0.071	-0.004	0.161
RET*Disability vs. OT	0.047	0.010	0.051	0.003	0.000	0.083	0.107	0.011	0.077
DE*Disability vs. RET	-0.014	-0.002	0.098	-0.085	-0.005	0.153	-0.178	-0.010	0.171
Male	-0.147***	-0.126	0.007	0.006	0.004	0.014	0.236***	0.099	0.015
White vs. Latinx	0.092***	0.042	0.018	0.185***	0.042	0.030	0.204***	0.045	0.034
Black vs. Latinx	-0.191***	-0.155	0.018	-0.363***	-0.148	0.028	-0.332***	-0.131	0.033
White vs. Black	0.283***	0.127	0.022	0.548***	0.124	0.032	0.536***	0.117	0.036
ELL	0.040**	0.034	0.011	0.071**	0.030	0.021	0.142***	0.059	0.023
Relative Age	0.019***	0.052	0.001	0.027***	0.082	0.002	0.026***	0.078	0.002
Public School Pre-K	-0.006	-0.005	0.010	-0.026	-0.010	0.017	-0.061**	-0.024	0.018
Pre-Academic Skills	0.005***	0.204	0.000	0.010***	0.227	0.000	0.014***	0.307	0.000
Parent BC	-0.001***	-0.039	0.000	-0.001**	-0.019	0.000	-0.001*	-0.016	0.000
Parent TPF	0.001***	0.051	0.000	0.002***	0.062	0.000	0.002***	0.048	0.000
Teacher BC	-0.002***	-0.086	0.000	-0.002***	-0.047	0.000	-0.002***	-0.055	0.000
Teacher TPF	0.001***	0.034	0.000	0.000	0.012	0.000	0.000	0.007	0.000
Post-VPK	-0.001	-0.001	0.009	-0.062***	-0.026	0.016	-0.148***	-0.059	0.020
Reduced-Price Lunch	-0.106***	-0.053	0.013	-0.173***	-0.044	0.029	-0.177***	-0.043	0.031
Free Lunch	-0.201***	-0.158	0.012	-0.344***	-0.136	0.021	-0.306***	-0.117	0.025
Retained G1-G5	-0.266***	-0.154	0.014	-0.573***	-0.166	0.022	-0.445***	-0.125	0.022
Constant	4.169***	--	0.026	2.685***	--	0.053	2.318***	--	0.059

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

Note. Multiple comparisons obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors, DE = delayed entry, RET = kindergarten retained, OT = on-time.

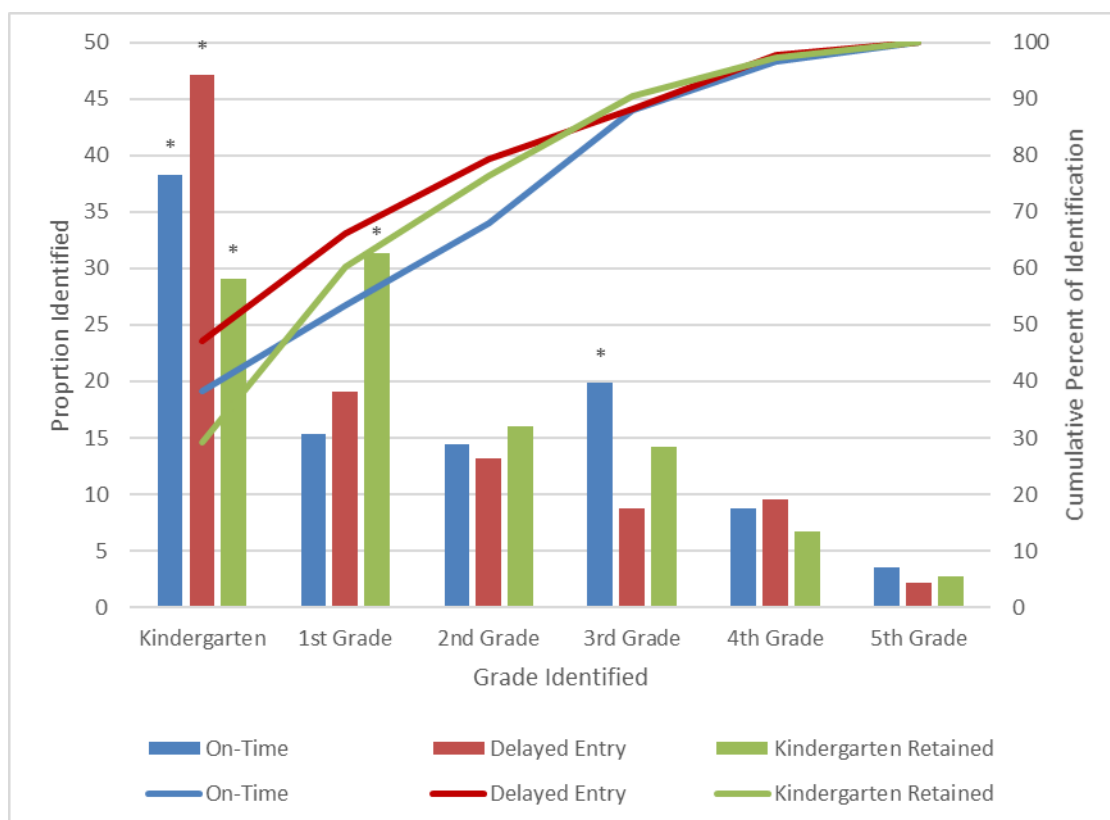


Figure 1 Timing of Disability Identification by Kindergarten Progression

* = Category of kindergarten progression is different from the others at the .05 level; adjusted for multiple comparisons using Bonferroni.

APPENDIX

Appendix Table 1 Sample Attrition

	Absent in 3 rd Grade (<i>n</i> = 2,036; 7.8%)	Absent in 5 th Grade (<i>n</i> = 3,265; 12.5%)
Child Characteristic		
Kindergarten Progression***		
On-Time	1,855 (7.4%) _a	2,997 (12.0%) _a
Delayed-Entry	48 (16.9%) _b	64 (22.5%) _b
Retained	133 (13.2%) _b	204 (20.3%) _b
Gender*		
Male	1,076 (8.1%) _a	1,705 (12.9%) _a
Female	960 (7.4%) _b	1,560 (12.0%) _b
Ethnicity***		
White/Asian/Other	159 (8.2%) _a	253 (13.0%) _a
Latinx	982 (6.5%) _b	1,515 (10.1%) _b
Black	895 (9.7%) _a	1,497 (16.1%) _c
FRL Status in Kindergarten***		
No FRL	377 (6.8%) _a	582 (10.6%) _a
Reduced-Price	170 (5.7%) _a	292 (9.7%) _a
Free Lunch	1,489 (8.4%) _b	2,391 (13.5%) _b
ELL Status***		
Non-ELL	1,043 (9.1%) _a	1,757 (15.4%) _a
ELL	993 (6.7%) _b	1,508 (10.2%) _b
Center Type***		
Center-Based	502 (6.3%) _a	806 (10.1%) _a
Public School	1,425 (8.5%) _b	2,233 (13.3%) _b
Disability Status***		
No Disability	1,726 (7.7%) _a	2,665 (11.9%) _a
Disability	310 (8.1%) _a	600 (15.7%) _b

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

Note. For each variable, the same subscript denotes a subset of variable categories whose column proportions do *not* differ from each other at the .05 level; adjusted for multiple comparisons using Bonferroni. Disability differences only significant for 5th grade attrition.

Appendix Table 2 Missing Data by Child Characteristics

Overall	Pre-Academic Scores (n = 8,562; 32.7%)	Teacher DECA (n = 2,546; 9.7%)	Parent DECA (n = 4,056; 15.5%)	G3 Reading (n = 162; 0.7%)	G3 Math (n = 165; 0.7%)	G5 Reading (n = 241; 1.1%)	G5 Math (n = 274; 1.2%)
Child Characteristic							
Kindergarten Progression							
On-Time	8,191 (32.9%) _a	2,342 (9.4%) _a	3,730 (15.0%) _a	132 (0.6%) _a	134 (0.6%) _a	175 (0.8%) _a	203 (0.9%) _a
Delayed-Entry	104 (36.6%) _a	74 (26.1%) _b	100 (35.2%) _b	10 (4.2%) _b	10 (4.2%) _b	19 (8.6%) _b	21 (9.5%) _b
Retained	267 (26.6%) _b	130 (12.9%) _c	226 (22.5%) _c	21 (2.4%) _b	21 (2.4%) _b	47 (5.9%) _b	50 (6.3%) _b
Gender							
Male	4,332 (32.8%) _a	1,341 (10.1%) _a	2,115 (16.0%) _a	113 (0.9%) _a	113 (0.9%) _a	165 (1.4%) _a	181 (1.6%) _a
Female	4,230 (32.6%) _a	1,205 (9.3%) _b	1,941 (14.9%) _b	50 (0.4%) _b	52 (0.4%) _b	76 (0.7%) _b	93 (0.8%) _b
Ethnicity							
White/Asian/Other	658 (33.9%) _a	171 (8.8%) _a	250 (12.9%) _a	14 (0.8%) _{a,b}	13 (0.7%) _a	15 (0.9%) _{a,b}	15 (0.9%) _a
Latinx	1,238 (34.2%) _a	1,246 (8.4%) _a	1,902 (12.7%) _a	75 (0.5%) _b	83 (0.6%) _a	106 (0.8%) _b	120 (0.9%) _a
Black	1,941 (29.9%) _b	1,111 (12.0%) _b	1,904 (20.5%) _b	74 (0.9%) _a	69 (0.8%) _a	120 (1.5%) _a	139 (1.8%) _b
FRL Status in Kindergarten							
No FRL	1,916 (34.8%) _a	608 (11.0%) _a	809 (14.7%) _a	26 (0.5%) _a	24 (0.5%) _a	29 (0.6%) _a	29 (0.6%) _a
Reduced-Price	1,010 (33.7%) _{a,b}	223 (7.4%) _b	338 (11.3%) _b	17 (0.6%) _a	19 (0.7%) _a	15 (0.6%) _a	17 (0.6%) _a
Free Lunch	5,636 (31.8%) _b	1,715 (9.7%) _c	2,909 (16.4%) _c	120 (0.7%) _a	122 (0.8%) _a	197 (1.3%) _b	228 (1.5%) _b
ELL Status							
Non-ELL	3,337 (29.2%) _a	1,324 (11.6%) _a	2,116 (18.5%) _a	80 (0.8%) _a	75 (0.7%) _a	125 (1.3%) _a	142 (1.5%) _a

ELL	5,225 (35.3%) _b	1,222 (8.3%) _b	1,904 (13.1%) _b	83 (0.6%) _a	90 (0.7%) _a	116 (0.9%) _b	132 (1.0%) _b
Center Type							
Center-Based	1,656 (20.8%) _a	753 (9.5%) _a	1,304 (16.4%) _a	60 (0.8%) _a	60 (0.8%) _a	89 (1.2%) _a	100 (1.4%) _a
Public School	5,950 (35.4%) _b	1,238 (7.4%) _b	2,023 (12.0%) _b	53 (0.3%) _b	57 (0.4%) _b	95 (0.7%) _b	112 (0.8%) _b
Disability Status							
No Disability	7,280 (32.5%) _a	2,024 (9.0%) _a	3,310 (14.8%) _a	31 (0.2%) _a	32 (0.2%) _a	77 (0.4%) _a	102 (0.5%) _a
Disability	1,282 (33.6%) _a	522 (13.7%) _b	746 (19.5%) _b	132 (3.8%) _b	133 (3.8%) _b	164 (5.1%) _b	172 (5.3%) _b

Note. For each variable, the same subscript denotes a subset of variable categories whose column proportions do *not* differ from each other at the .05 level; adjusted for multiple comparisons using Bonferroni method. Missing percentages for 3rd and 5th grade columns calculated using children who completed the grade-level, evidenced by having end-of-year grades (*ns* = 24,171 and 22,942 respectively).

Appendix Table 3 3rd Grade GPA, Reading, and Math Outcomes for Children's First Time Through 3rd Grade

Variable	GPA			Reading			Math		
	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)
Delayed Entry vs. On-Time	-0.157***	-0.024	0.045	-0.201**	-0.016	0.072	-0.340***	-0.028	0.074
Retained in K vs. On-Time	-0.176***	-0.051	0.025	-0.288***	-0.045	0.039	-0.323***	-0.051	0.037
Delayed Entry vs. Retained in K	0.020	0.003	0.050	0.087	0.007	0.080	-0.017	-0.001	0.075
Male	-0.117***	-0.092	0.008	0.036*	0.015	0.014	0.181***	0.078	0.014
White vs. Latinx	0.081***	0.033	0.017	0.122***	0.027	0.029	0.126***	0.028	0.028
Black vs. Latinx	-0.202***	-0.151	0.018	-0.323***	-0.129	0.027	-0.329***	-0.135	0.028
White vs. Black	0.283***	0.120	0.021	0.445***	0.098	0.034	0.455***	0.103	0.032
ELL	0.025*	0.019	0.012	0.055**	0.023	0.020	0.097***	0.041	0.021
Relative Age	0.019***	0.102	0.001	0.039***	0.114	0.002	0.038***	0.116	0.002
Public School Pre-K	-0.010	0.008	0.012	-0.025	-0.010	0.018	-0.035	-0.014	0.019
Pre-Academic Skills	0.007***	0.271	0.000	0.014***	0.312	0.000	0.014***	0.316	0.000
Parent BC	-0.001***	-0.031	0.000	-0.001**	-0.020	0.000	-0.001***	-0.017	0.000
Parent TPF	0.001***	0.055	0.000	0.002***	0.061	0.000	0.002***	0.058	0.000
Teacher BC	-0.002***	-0.094	0.000	-0.002***	-0.057	0.000	-0.002***	-0.048	0.000
Teacher TPF	0.001**	0.027	0.000	0.001	0.017	0.000	0.001**	0.026	0.000
Post-VPK	0.082***	0.061	0.011	-0.081***	-0.032	0.019	0.244***	0.101	0.019
Reduced-Price Lunch in G3	-0.108***	-0.055	0.014	-0.156***	-0.042	0.025	-0.102***	-0.029	0.025
Free Lunch in G3	-0.237***	-0.174	0.013	-0.350***	-0.137	0.022	-0.290***	-0.117	0.022
Has Disability in G3	-0.188***	-0.090	0.016	-0.545***	-0.139	0.026	-0.469***	-0.123	0.028
Retained G1-G2	-0.206***	-0.080	0.016	-0.262***	-0.054	0.030	-0.282***	-0.060	0.029
Constant	3.905***	--	0.034	2.424***	--	0.057	2.334***	--	0.057

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

Note. Multiple comparisons for kindergarten progression and ethnicity obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors.

Appendix Table 4 5th Grade GPA, Reading, and Math Outcomes for Children's First Time Through 5th Grade

Variable	GPA			Reading			Math		
	<i>B</i>	β	<i>SE (B)</i>	<i>B</i>	β	<i>SE (B)</i>	<i>B</i>	β	<i>SE (B)</i>
Delayed Entry vs. On-Time	-0.146***	-0.024	0.041	-0.221***	-0.018	0.065	-0.270***	-0.022	0.076
Retained in K vs. On-Time	-0.210***	-0.065	0.022	-0.327***	-0.051	0.039	-0.407***	-0.061	0.038
Delayed Entry vs. Retained in K	0.064	0.011	0.045	0.106	0.009	0.073	0.138	0.011	0.084
Male	-0.147***	-0.126	0.007	0.005	0.002	0.014	0.235***	0.098	0.015
White vs. Latinx	0.084***	0.038	0.017	0.173***	0.039	0.029	0.193***	0.042	0.033
Black vs. Latinx	-0.183***	-0.148	0.018	-0.351***	-0.143	0.028	-0.323***	-0.128	0.033
White vs. Black	0.268***	0.120	0.022	0.523***	0.118	0.031	0.516***	0.113	0.036
ELL	0.042***	0.036	0.011	0.076***	0.032	0.021	0.144***	0.060	0.023
Relative Age	0.009***	0.053	0.001	0.027***	0.082	0.002	0.027***	0.078	0.002
Public School Pre-K	-0.008	-0.007	0.010	-0.030	-0.012	0.017	-0.064***	-0.025	0.018
Pre-Academic Skills	0.005***	0.204	0.000	0.010***	0.227	0.000	0.014***	0.307	0.000
Parent BC	-0.001***	-0.039	0.000	-0.001**	-0.019	0.000	-0.001*	-0.016	0.000
Parent TPF	0.001***	0.050	0.000	0.002***	0.061	0.000	0.002***	0.048	0.000
Teacher BC	-0.002***	-0.084	0.000	-0.002***	-0.046	0.000	-0.002***	-0.054	0.000
Teacher TPF	0.001***	0.033	0.000	0.000	0.012	0.000	0.000	0.006	0.000
Post-VPK	0.000	0.000	0.009	-0.059***	-0.024	0.016	-0.145***	-0.058	0.019
Reduced-Price Lunch in G5	-0.128***	-0.065	0.013	-0.205***	-0.052	0.030	-0.201***	-0.049	0.031
Free Lunch in G5	-0.228***	-0.176	0.012	-0.386***	-0.150	0.022	-0.341***	-0.128	0.026
Has Disability in G5	-0.151***	-0.081	0.017	-0.509***	-0.138	0.028	-0.414***	-0.109	0.029
Retained G1-G4	-0.266	-0.152	0.014	-0.569***	-0.164	0.022	0.443***	-0.124	0.022
Constant	4.188***	--	0.026	2.717***	--	0.053	2.344***	--	0.059

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

Note. Multiple comparisons for kindergarten progression and ethnicity obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors.

Appendix Table 5 3rd Grade GPA, Reading, and Math Outcomes with Interactions between Kindergarten Progression and Disability Status for Children's First Time Through 3rd Grade

Variable	GPA			Reading			Math		
	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)
Delayed Entry vs. On-Time	-0.234***	-0.036	0.062	-0.276**	-0.022	0.093	-0.372***	-0.031	0.098
Retained in K vs. On-Time	-0.195***	-0.056	0.028	-0.296***	-0.046	0.050	-0.311***	-0.050	0.048
Delayed Entry vs. Retained in K	-0.039	-0.006	0.067	0.020	0.002	0.108	-0.061	-0.005	0.103
Has Disability in G3	-0.199***	-0.095	0.016	-0.552***	-0.141	0.029	-0.467***	-0.122	0.031
DE*Disability vs. OT	0.192	0.019	0.100	0.197	0.010	0.152	0.079	0.004	0.173
RET*Disability vs. OT	0.059	0.010	0.044	0.092	0.003	0.092	-0.036	-0.003	0.087
DE*Disability vs. RET	0.133	0.013	0.104	0.168	0.009	0.171	0.115	0.006	0.182
Male	-0.117***	-0.092	0.008	0.036**	0.015	0.014	0.181***	0.078	0.014
White vs. Latinx	0.081***	0.033	0.017	0.122***	0.027	0.029	0.126***	0.028	0.028
Black vs. Latinx	-0.202***	-0.151	0.018	-0.323***	-0.129	0.027	-0.329***	-0.135	0.028
White vs. Black	0.283***	0.116	0.021	0.445***	0.098	0.034	0.455***	0.103	0.032
ELL	0.024*	0.019	0.012	0.055**	0.023	0.020	0.097***	0.041	0.021
Relative Age	0.019***	0.102	0.001	0.039***	0.114	0.002	0.038***	0.116	0.002
Public School Pre-K	-0.010	-0.008	0.012	-0.025*	-0.010	0.018	-0.035	-0.014	0.019
Pre-Academic Skills	0.007***	0.271	0.000	0.014***	0.312	0.000	0.014***	0.316	0.000
Parent BC	-0.001***	-0.031	0.000	-0.001**	-0.020	0.000	-0.001**	-0.017	0.000
Parent TPF	0.001***	0.055	0.000	0.002***	0.061	0.000	0.002***	0.058	0.000
Teacher BC	-0.002***	-0.094	0.000	-0.002***	-0.057	0.000	-0.002***	-0.048	0.000
Teacher TPF	0.001**	0.027	0.000	0.001	0.017	0.000	0.001**	0.026	0.000
Post-VPK	0.082***	0.062	0.011	-0.081***	-0.032	0.019	0.244***	0.101	0.019
Reduced-Price Lunch in G3	-0.108***	-0.055	0.014	-0.156***	-0.042	0.025	-0.102***	-0.029	0.025
Free Lunch in G3	-0.237***	-0.174	0.013	-0.350***	-0.137	0.022	-0.290***	-0.117	0.022
Retained G1-G2	-0.204***	-0.079	0.016	-0.260***	-0.054	0.030	-0.283***	-0.060	0.029
Constant	3.906***	--	0.034	2.424***	--	0.057	2.334***	--	0.057

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

Note. Multiple comparisons obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors, DE = delayed entry, RET = kindergarten retained, OT = on-time.

Appendix Table 6 5th Grade GPA, Reading, and Math Outcomes with Interactions between Kindergarten Progression and Disability Status for Children's First Time Through 5th Grade

Variable	GPA			Reading			Math		
	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)	<i>B</i>	β	<i>SE</i> (<i>B</i>)
Delayed Entry vs. On-Time	-0.161**	-0.027	0.048	-0.184*	-0.015	0.088	-0.235*	-0.019	0.103
Retained in K vs. On-Time	-0.228***	-0.070	0.032	-0.328***	-0.051	0.050	-0.450***	-0.068	0.050
Delayed Entry vs. Retained in K	0.067	0.011	0.056	0.143	0.012	0.098	0.215	0.017	0.112
Has Disability in G5	-0.156***	-0.084	0.017	-0.507***	-0.138	0.030	-0.423***	-0.111	0.032
DE*Disability vs. OT	0.034	0.004	0.085	-0.078	-0.005	0.135	-0.067	-0.004	0.162
RET*Disability vs. OT	0.044	0.009	0.051	-0.001	0.000	0.082	0.109	0.011	0.078
DE*Disability vs. RET	-0.010	-0.001	0.098	-0.077	-0.005	0.150	-0.176	-0.010	0.172
Male	-0.147***	-0.126	0.007	0.005	0.002	0.014	0.235***	0.098	0.015
White vs. Latinx	0.084***	0.038	0.017	0.173***	0.039	0.029	0.193***	0.042	0.033
Black vs. Latinx	-0.183***	-0.149	0.018	-0.351***	-0.143	0.028	-0.323***	-0.128	0.033
White vs. Black	0.268***	0.120	0.022	0.523***	0.118	0.031	0.516***	0.113	0.036
ELL	0.042***	0.038	0.011	0.076***	0.032	0.021	0.144***	0.060	0.023
Relative Age	0.009***	0.053	0.001	0.027***	0.082	0.002	0.027***	0.078	0.002
Public School Pre-K	-0.008	-0.007	0.010	-0.030	-0.012	0.017	-0.064***	-0.025	0.018
Pre-Academic Skills	0.005***	0.204	0.000	0.010***	0.227	0.000	0.014***	0.306	0.000
Parent BC	-0.001***	-0.039	0.000	-0.001**	-0.019	0.000	-0.001*	-0.016	0.000
Parent TPF	0.001***	0.051	0.000	0.002***	0.061	0.000	0.002***	0.048	0.000
Teacher BC	-0.002***	-0.084	0.000	-0.002***	-0.046	0.000	-0.002***	-0.054	0.000
Teacher TPF	0.001***	0.033	0.000	0.000	0.012	0.000	0.000	0.006	0.000
Post-VPK	0.000	0.000	0.009	-0.059***	-0.024	0.016	-0.145***	-0.058	0.019
Reduced-Price Lunch in G5	-0.128***	-0.065	0.013	-0.205***	-0.052	0.030	-0.201***	-0.049	0.031
Free Lunch in G5	-0.228***	-0.176	0.012	-0.386***	-0.150	0.022	-0.341***	-0.128	0.026
Retained G1-G2	-0.265***	-0.152	0.014	-0.570***	-0.164	0.022	-0.441***	-0.123	0.023
Constant	4.189***	--	0.026	2.717***	--	0.053	2.346***	--	0.059

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

Note. Multiple comparisons obtained by changing the reference group and running the model a second time. BC = Behavior Concerns, TPF = Total Protective Factors, DE = delayed entry, RET = kindergarten retained, OT = on-time.

REFERENCES

- Albanesi, H. P. (2019). Tilting the playing field: “Redshirting” kindergarten boys in the US and the competition for hegemonic masculinity. *Gender & Education*, 31(2), 240–257. <https://doi.org/10.1080/09540253.2017.1309009>
- Anderson, G. E., Jimerson, S. R., & Whipple, A. D. (2005). Student ratings of stressful experiences at home and school. *Journal of Applied School Psychology*, 21(1), 1–20. https://doi.org/10.1300/J370v21n01_01
- Andrew, M. (2014). The scarring effects of primary-grade retention? A study of cumulative advantage in the educational career. *Social Forces*, 93(2), 653–685. <https://doi.org/10.1093/sf/sou074>
- Ansari, A., López, M., Manfra, L., Bleiker, C., Dinehart, L. H. B., Hartman, S. C., & Winsler, A. (2017). Differential third-grade outcomes associated with attending publicly funded preschool programs for low-income Latino children. *Child Development*, 88(5), 1743–1756. <https://doi.org/10.1111/cdev.12663>
- Ansari, A., & Winsler, A. (2016). Kindergarten readiness for low-income and ethnically diverse children attending publicly funded preschool programs in Miami. *Early Childhood Research Quarterly*, 37(4), 69-80. <https://doi.org/10.1016/j.ecresq.2016.06.002>

Barnett, K. P., Clarizio, H. F., & Payette, K. A. (1996). Grade retention among students with learning disabilities. *Psychology in the Schools*, 33(4), 285–293.

[https://doi.org/10.1002/\(SICI\)1520-6807\(199610\)33:4<285::AID-PITS3>3.0.CO;2-M](https://doi.org/10.1002/(SICI)1520-6807(199610)33:4<285::AID-PITS3>3.0.CO;2-M)

Bassok, D., Latham, S., & Rorem, A. (2016). Is kindergarten the new first grade? *AERA Open*, 2(1), 2332858415616358. <https://doi.org/10.1177/2332858415616358>

Bassok, D., & Reardon, S. F. (2013). “Academic redshirting” in kindergarten: Prevalence, patterns, and implications. *Educational Evaluation and Policy Analysis*, 35(3), 283–297. <https://doi.org/10.3102/0162373713482764>

Cameron, M. B., & Wilson, B. J. (1990). The effects of chronological age, gender, and delay of entry on academic achievement and retention: Implications for academic redshirting. *Psychology in the Schools*, 27(3), 260–263.

[https://doi.org/10.1002/1520-6807\(199007\)27:3<260::AID-PITS2310270313>3.0.CO;2-V](https://doi.org/10.1002/1520-6807(199007)27:3<260::AID-PITS2310270313>3.0.CO;2-V)

Carlton, M. P., & Winsler, A. (1999). School readiness: The need for a paradigm shift. *School Psychology Review*, 28(3), 338–352.

Cosden, M., Zimmer, J., & Tuss, P. (1993). The impact of age, sex, and ethnicity on kindergarten entry and retention decisions. *Educational Evaluation and Policy Analysis*, 15(2), 209–222. <https://doi.org/10.2307/1164422>

Crane, J., Mincic, M. S., & Winsler, A. (2011). Parent–teacher agreement and reliability on the Devereux Early Childhood Assessment (DECA) in English and Spanish for

- ethnically diverse children living in poverty. *Early Education and Development*, 22(3), 520–547. <https://doi.org/10.1080/10409289.2011.565722>
- Dagli, U. Y., & Jones, I. (2013). The longitudinal effects of kindergarten enrollment and relative age on children's academic achievement. *Teachers College Record*, 115(3).
- Datar, A. (2006). Does delaying kindergarten entrance give children a head start? *Economics of Education Review*, 25(1), 43–62. <https://doi.org/10.1016/j.econedurev.2004.10.004>
- Datar, A., & Gottfried, M. A. (2015). School entry age and children's social-behavioral skills: Evidence From a national longitudinal study of U.S. kindergartners. *Educational Evaluation and Policy Analysis*, 37(3), 333–353. <https://doi.org/10.3102/0162373714547268>
- Dauber, S. L., Alexander, K. L., & Entwisle, D. R. (1993). Characteristics of retainees and early precursors of retention in grade: Who is held back? *Merrill-Palmer Quarterly*, 39(3), 326–343.
- Davoudzadeh, P., McTernan, M. L., & Grimm, K. J. (2015). Early school readiness predictors of grade retention from kindergarten through eighth grade: A multilevel discrete-time survival analysis approach. *Early Childhood Research Quarterly*, 32, 183–192. <https://doi.org/10.1016/j.ecresq.2015.04.005>
- Demaret, J., & Van Houtte, M. (2016). Are flunkers social outcasts? A multilevel study of grade retention effects on same-grade friendships. *American Educational Research Journal*, 53(3), 745–780. <https://doi.org/10.3102/0002831216646867>

- Domina, T., Pharris-Ciurej, N., Penner, A. M., Penner, E. K., Brummet, Q., Porter, S. R., & Sanabria, T. (2018). Is free and reduced-price lunch a valid measure of educational disadvantage? *Educational Researcher*, 47(9), 539–555.
<https://doi.org/10.3102/0013189X18797609>
- Education Commission of the States. (2018). *What is the state's kindergarten entrance age?* <http://ecs.force.com/mbdata/MBQuest2RTanw?rep=KK3Q1802>
- Federal Registrar. (2006). *Department of agriculture: Food and nutrition service Vol. 71* (No. 50; p. 13336). <https://www.gpo.gov/fdsys/pkg/FR-2006-03-15/pdf/06-2476.pdf>
- Fletcher, J., & Kim, T. (2016). The effects of changes in kindergarten entry age policies on educational achievement. *Economics of Education Review*, 50, 45–62.
<https://doi.org/10.1016/j.econedurev.2015.11.004>
- Florida Department of Education. (n.d.). *Assessments & Publications Archive*.
<http://www.fldoe.org/accountability/assessments/k-12-student-assessment/archive/index.shtml>
- Florida Department of Education. (2020). *Public school student progression; student support; reporting requirements*. Retrieved from
http://leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=1000-1099/1008/Sections/1008.25.html
- Fortner, C. K., & Jenkins, J. M. (2017). Kindergarten redshirting: Motivations and spillovers using census-level data. *Early Childhood Research Quarterly*, 38, 44–56. <https://doi.org/10.1016/j.ecresq.2016.09.002>

- Fortner, C. K., & Jenkins, J. M. (2018). Is delayed school entry harmful for children with disabilities? *Early Childhood Research Quarterly, 44*, 170–180.
<https://doi.org/10.1016/j.ecresq.2018.03.013>
- Frey, N. (2005). Retention, social promotion, and academic redshirting: What do we know and need to know? *Remedial and Special Education, 26*(6), 332–346.
<https://doi.org/10.1177/07419325050260060401>
- Gleason, K. A., Kwok, O., & Hughes, J. N. (2007). The short-term effect of grade retention on peer relations and academic performance of at-risk first graders. *The Elementary School Journal, 107*(4), 327–340. <https://doi.org/10.1086/516667>
- Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prevention Science, 8*(3), 206–213. <https://doi.org/10.1007/s11121-007-0070-9>
- Graue, M. E. (2009). Reimagining kindergarten: Restoring a developmental approach when accountability demands are pushing formal instruction on the youngest learners. *School Administrator, 66*(10), 10–15.
- Graue, M. E., & DiPerna, J. (2000). Redshirting and early retention: Who gets the “gift of time” and what are its outcomes? *American Educational Research Journal, 37*(2), 509–534. <https://doi.org/10.3102/00028312037002509>
- Greenburg, J. E., & Winsler, A. (2020). Delayed kindergarten entry among low-income, ethnically diverse children: Prevalence, predictors, and selection patterns. *Early Childhood Research Quarterly, 53*, 496–506.
<https://doi.org/10.1016/j.ecresq.2020.06.007>

- Greenburg, J. E., & Winsler, A. (2021). Early school outcomes for children who delay kindergarten entry. In S. Tatalović Vorkapić & J. LoCasale-Crouch (Eds.), *Supporting Children's Well-Being During Early Childhood Transition to School* (pp. 275–302). IGI Global. <http://doi:10.4018/978-1-7998-4435-8.ch013>
- Greenburg, J. E., & Winsler, A. (2021, April). Third grade academic outcomes for delayed-entry students with and without disabilities. Poster to be presented at the Society for Research in Child Development's Biennial Conference. Virtual.
- Halle, T., Hair, E., Wandner, L., McNamara, M., & Chien, N. (2012). Predictors and outcomes of early vs. later English language proficiency among English language learners. *Early Childhood Research Quarterly*, 27(1), 1-20.
<https://doi.org/10.1016/j.ecresq.2011.07.004>
- Hanly, M., Edwards, B., Goldfeld, S., Craven, R. G., Mooney, J., Jorm, L., & Falster, K. (2019). School starting age and child development in a state-wide, population-level cohort of children in their first year of school in New South Wales, Australia. *Early Childhood Research Quarterly*, 48, 325–340.
<https://doi.org/10.1016/j.ecresq.2019.01.008>
- Hong, G., & Raudenbush, S. W. (2005). Effects of kindergarten retention policy on children's cognitive growth in reading and mathematics. *Educational Evaluation and Policy Analysis*, 27(3), 205–224.
<https://doi.org/10.3102/01623737027003205>

- Hong, G., & Raudenbush, S. W. (2006). Evaluating kindergarten retention policy. *Journal of the American Statistical Association*, 101(475), 901–910.
<https://doi.org/10.1198/016214506000000447>
- Hong, G., & Yu, B. (2007). Early-grade retention and children's reading and math learning in elementary years. *Educational Evaluation and Policy Analysis*, 29(4), 239–261. <https://doi.org/10.3102/0162373707309073>
- Hong, G., & Yu, B. (2008). Effects of kindergarten retention on children's social-emotional development: An application of propensity score method to multivariate, multilevel data. *Developmental Psychology*, 44(2), 407–421.
<https://doi.org/10.1037/0012-1649.44.2.407>
- Huang, F. L. (2014). Further understanding factors associated with grade retention: Birthday effects and socioemotional skills. *Journal of Applied Developmental Psychology*, 35(2), 79–93. <https://doi.org/10.1016/j.appdev.2013.12.004>
- Huang, F. L. (2015). Investigating the prevalence of academic redshirting using population-level data. *AERA Open*, 1(2), 1–11.
<https://doi.org/10.1177/2332858415590800>
- Huang, F. L., & Invernizzi, M. A. (2012). The association of kindergarten entry age with early literacy outcomes. *The Journal of Educational Research*, 105(6), 431–441.
<https://doi.org/10.1080/00220671.2012.658456>
- Jacob, B. A., & Lefgren, L. (2009). The effect of grade retention on high school completion. *American Economic Journal: Applied Economics*, 1(3), 33–58.
<https://doi.org/10.1257/app.1.3.33>

- Janus, M., & Duku, E. (2007). The school entry gap: Socioeconomic, family, and health Factors associated with children's school readiness to learn. *Early Education and Development, 18*(3), 375–403. <https://doi.org/10.1080/10409280701610796a>
- Jiang, H., Justice, L., Purtell, K. M., Lin, T.-J., & Logan, J. (2021). Prevalence and prediction of kindergarten-transition difficulties. *Early Childhood Research Quarterly, 55*, 15–23. <https://doi.org/10.1016/j.ecresq.2020.10.006>
- Jimerson, S. R. (2001). Meta-analysis of grade retention research: Implications for practice in the 21st century. *School Psychology Review, 30*(3), 420.
- Jones, L. D., & Sutherland, H. (1981). Academic redshirting a positive approach to grade retention. *Education, 102*(2), 173.
- Keller-Margulis, M., & Gischlar, K. (2014). Response to intervention and retention for children with specific learning disabilities: Differences in academic achievement between retained and non-retained students. *Contemporary School Psychology; Heidelberg, 18*(1), 35–43. <http://dx.doi.org.mutext.gmu.edu/10.1007/s40688-013-0007-1>
- Kundert, D. K., May, D. C., & Brent, D. (1995). A comparison of students who delay kindergarten entry and those who are retained in grades K–5. *Psychology in the Schools, 32*(3), 202–209. [https://doi.org/10.1002/1520-6807\(199507\)32:3<202::AID-PITS2310320307>3.0.CO;2-6](https://doi.org/10.1002/1520-6807(199507)32:3<202::AID-PITS2310320307>3.0.CO;2-6)
- LeBuffe, P. A., & Naglieri, J. A. (1992). *The Devereux Early Child Assessment (DECA)*. Kaplan Early Learning.

Lenard, M. A., & Peña, P. A. (2018). Maturity and minorities: The impact of redshirting on achievement gaps. *Education Economics*, 26(6), 593–609.

<https://doi.org/10.1080/09645292.2018.1468873>

Lincove, J. A., & Painter, G. (2006). Does the age that children start kindergarten matter? Evidence of long-term educational and social outcomes. *Educational Evaluation and Policy Analysis*, 28(2), 153–179.

<https://doi.org/10.3102/01623737028002153>

Locke, V. N., & Sparks, P. J. (2019). Who gets held back? An analysis of grade retention using stratified frailty models. *Population Research and Policy Review*.

<https://doi.org/10.1007/s11113-019-09524-3>

Macdonald, K., Milne, N., Orr, R., & Pope, R. (2018). Relationships between motor proficiency and academic performance in mathematics and reading in school-aged children and adolescents: A systematic review. *International Journal of Environmental Research and Public Health*, 15(8).

<https://doi.org/10.3390/ijerph15081603>

Mantzicopoulos, P., & Morrison, D. (1992). Kindergarten retention: Academic and behavioral outcomes through the end of second grade. *American Educational Research Journal*, 29(1), 182–198. <https://doi.org/10.3102/00028312029001182>

Marsh, H. W. (1987). The big-fish-little-pond effect on academic self-concept. *Journal of Educational Psychology*, 79(3), 280–295. <https://doi.org/10.1037/0022-0663.79.3.280>

- Marsh, H. W., & Hau, K.-T. (2003). Big-Fish--Little-Pond effect on academic self-concept: A cross-cultural (26-country) test of the negative effects of academically selective schools. *American Psychologist*, 58(5), 364.
<https://doi.org/10.1037/0003-066X.58.5.364>
- Martin, A. J. (2009). Age appropriateness and motivation, engagement, and performance in high school: Effects of age within cohort, grade retention, and delayed school entry. *Journal of Educational Psychology*, 101(1), 101–114.
<https://doi.org/10.1037/a0013100>
- May, D. C., Kundert, D. K., & Brent, D. (1995). Does delayed school entry reduce later grade retentions and use of special education services? *Remedial and Special Education*, 16(5), 288–294. <https://doi.org/10.1177/074193259501600505>
- McCombs, J. S., Kirby, S. N., & Mariano, L. T. (Eds.). (2009). *Ending social promotion without leaving children behind: The case of New York City*.
<https://www.rand.org/pubs/monographs/MG894.html>
- McCormick, M. P., Weiland, C., Hsueh, J., Maier, M., Hagos, R., Snow, C., Leacock, N., & Schick, L. (2020). Promoting content-enriched alignment across the early grades: A study of policies & practices in the Boston Public Schools. *Early Childhood Research Quarterly*, 52, 57–73.
<https://doi.org/10.1016/j.ecresq.2019.06.012>
- Mendez, L. M. R., Kim, E. S., Ferron, J., & Woods, B. (2015). Altering school progression through delayed entry or kindergarten retention: Propensity score

- analysis of long-term outcomes. *The Journal of Educational Research*, 108(3), 186–203. <https://doi.org/10.1080/00220671.2013.867474>
- Miami Dade County Public Schools (n.d.) *Statistical Highlights*.
<http://drs.dadeschools.net/StatisticalHighlights/SH.asp>
- Moser, S. E., West, S. G., & Hughes, J. N. (2012). Trajectories of math and reading achievement in low achieving children in elementary school: Effects of early and later retention in grade. *Journal of Educational Psychology*, 104(3), 603–621.
<https://doi.org/10.1037/a0027571>
- Nehring, A. D., Nehring, E. F., Bruni, J. R., & Randolph, P. L. (1992). *Learning Accomplishment Profile–Diagnostic Standardized Assessment*. Kaplan Press.
- Noel, A. M., & Newman, J. (2003). Why delay kindergarten entry? A qualitative study of mothers' decisions. *Early Education and Development*, 14(4), 479–498.
https://doi.org/10.1207/s15566935eed1404_6
- Pagani, L., Tremblay, R. E., Vitaro, F., Boulerice, B., & McDuff, P. (2001). Effects of grade retention on academic performance and behavioral development. *Development and Psychopathology*, 13(2), 297–315.
<https://doi.org/10.1017/s0954579401002061>
- Peixoto, F., Monteiro, V., Mata, L., Sanches, C., Pipa, J., & Almeida, L. S. (2016). “To be or not to be retained ... That’s the question!” Retention, self-esteem, self-concept, achievement goals, and grades. *Frontiers in Psychology*, 7.
<https://doi.org/10.3389/fpsyg.2016.01550>

- Planty, M., Hussar, W., Snyder, T., Kena, G., KewalRemani, A., Kemp, J., Bianco, K., Dinkes, R., Ferguson, K., Livingston, A., & Nachazel, T. (2009). *The condition of education 2009*. National Center for Education Statistics.
- Plummer, D. L., & Graziano, W. G. (1987). Impact of grade retention on the social development of elementary school children. *Developmental Psychology*, 23(2), 267–275. <https://doi.org/10.1037/0012-1649.23.2.267>
- Rimm-Kaufman, S. E., & Pianta, R. C. (2000). An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology*, 21(5), 491–511. [http://dx.doi.org/10.1016/S0193-3973\(00\)00051-4](http://dx.doi.org/10.1016/S0193-3973(00)00051-4)
- Schwerdt, G., West, M. R., & Winters, M. A. (2017). The effects of test-based retention on student outcomes over time: Regression discontinuity evidence from Florida. *Journal of Public Economics*, 152, 154–169. <https://doi.org/10.1016/j.jpubeco.2017.06.004>
- Silverstein, M., Guppy, N., Young, R., & Augustyn, M. (2009). The receipt of special education services following elementary school grade retention. *Archives of Pediatrics & Adolescent Medicine*, 163(6), 547–553. <https://doi.org/10.1001/archpediatrics.2009.54>
- Speybroeck, S., Kuppens, S., Damme, J. V., Petegem, P. V., Lamote, C., Boonen, T., & Bilde, J. de. (2012). The role of teachers' expectations in the association between children's ses and performance in kindergarten: A moderated mediation analysis. *PLOS ONE*, 7(4), e34502. <https://doi.org/10.1371/journal.pone.0034502>

- Steiner, P. M., Park, S., & Kim, Y. (2016). Identifying causal estimands for time-varying treatments measured with time-varying (age or grade-based) instruments. *Multivariate Behavioral Research, 51*(6), 865–8780.
<https://doi.org/10.1080/00273171.2016.1205470>
- Stewart, P. (2011). *Florida Department of Education: Read to learn*.
<http://info.fldoe.org/docushare/dsweb/Get/Document-6738/dps-2013-56b.pdf>
- Stipek, D. (2002). At What Age Should Children Enter Kindergarten? A Question for Policy Makers and Parents. *Social Policy Report, 16*(2), 1–20.
<https://doi.org/10.1002/j.2379-3988.2002.tb00018.x>
- Tavassolie, T., & Winsler, A. (2019). Predictors of mandatory 3rd grade retention from high-stakes test performance for low-income, ethnically diverse children. *Early Childhood Research Quarterly, 48*, 62–74.
<https://doi.org/10.1016/j.ecresq.2019.02.002>
- U.S. Department of Education. (2015). *A matter of equity: Preschool in America*.
<https://www2.ed.gov/documents/early-learning/matter-equity-preschool-america.pdf>
- Vandecandelaere, M., Vansteelandt, S., De Fraine, B., & Van Damme, J. (2016). The effects of early grade retention: Effect modification by prior achievement and age. *Journal of School Psychology, 54*, 77–93.
<https://doi.org/10.1016/j.jsp.2015.10.004>

- Warren, J. R., Hoffman, E., & Andrew, M. (2014). Patterns and trends in grade retention rates in the United States, 1995–2010. *Educational Researcher*, 43(9), 433–443. <https://doi.org/10.3102/0013189X14563599>
- Winsler, A, Tran, H., Hartman, S. C., Madigan, A. L., Manfra, L., & Bleiker, C. (2008). School readiness gains made by ethnically diverse children in poverty attending center-based childcare and public school pre-kindergarten programs. *Early Childhood Research Quarterly*, 23(3), 314–329. <https://doi.org/10.1016/j.ecresq.2008.02.003>
- Winsler, Adam, Hutchinson, L., De Feyter, J., Manfra, L., Bleiker, L., & Hartman, S. (2012). Child, family, and childcare predictors of delayed school entry and kindergarten retention among linguistically and ethnically diverse children. *Developmental Psychology*, 48(12), 1299–1314. <https://doi.org/10.1037/a0026985>
- Wu, W., West, S. G., & Hughes, J. N. (2008). Effect of retention in first grade on children's achievement trajectories over 4 years: A piecewise growth analysis using propensity score matching. *Journal of Educational Psychology*, 100(4), 727–740. <https://doi.org/10.1037/a0013098>
- Wu, W., West, S. G., & Hughes, J. N. (2010). Effect of grade retention in first grade on psychosocial outcomes. *Journal of Educational Psychology*, 102(1), 135–152. <https://doi.org/10.1037/a0016664>

BIOGRAPHY

Jordan E. Greenburg grew up in Cordova, TN. A proud teacher's kid, she attributes the many hours spent sitting in her mom's classroom to be foundational to her lifelong love of education. These educational roots represent a common thread across most of Jordan's work. Jordan graduated from Collierville High School in 2013. She attended Emory & Henry College where she received her Bachelor of Arts in Psychology and French in 2017. Jordan received her Master of Arts in Applied Developmental Psychology from George Mason University in 2019, and her Ph.D. in 2021.