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IMPACT OF RELATIVE AGE ON NEED FOR SPECIAL EDUCATION SERVICES

A MASTER'S THESIS
SUBMITTED TO THE FACULTY
OF BETHEL UNIVERSITY

BY
LEONIE GILES

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BETHEL UNIVERSITY

IMPACT OF RELATIVE AGE ON NEED FOR SPECIAL EDUCATION SERVICES

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APPROVED

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Abstract

This thesis consists of a literature review of research on a potential correlation between a student's birthdate, age upon entry into kindergarten, and the potential need for special education services while in elementary school. Results were mixed on the benefits of delaying entry into school. While results appeared contradictory at times, closer analysis indicates that benefits depend on the individual, on the presence of a disability, the gender, and socio-economic status, and on when a student is born. Students born in the months directly preceding kindergarten eligibility are at a disadvantage when compared to those born right after the cut-off date, as indicated by higher special education referral rates. While no definitive answer is possible to the initial research question, we have learned that while a relatively young age can have an impact on a student, delaying entry into kindergarten is not a fix-it-all, and while beneficial for some, it may be detrimental for others.

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CHAPTER I: INTRODUCTION

As if parents are not under enough pressure to raise successful, well-adjusted children, they also have to worry about the impact of when to send their child to kindergarten. Depending on who you ask, sending them as soon as they are eligible can either be your best or your worst parenting decision. Having a suspicion that your child may have a need for special education services increases that pressure even more. What is a parent to do?

Context

Research can be found dating back almost 100 years trying to find answers to questions surrounding the appropriate age for students to start kindergarten and any correlation between referrals for special education. At that time, a correlation was found between chronological age and referral rate for special classes, which was heightened for boys (Wallin, 1930). This research predated the Education for All Handicapped Children Act of 1975, which ensured that all children, including those with disabilities, had the right to a free and appropriate public education (Santrock, 2011, p.99).

Developmental Theories

According to Piaget, development and learning occur in four stages. Considering children are typically in Piaget's preoperational stage from ages two to seven and that in the majority of the United States students are eligible for kindergarten after they turn 5, there is a wide range of development that students will come to school with, which can impact their school readiness. Vygotsky determined that teachers are facilitators for

growth, as part of a strong emphasis on the social cultures children find themselves in.

Language development is consistent for children all over the world, regardless of environmental differences and milestones are reached around roughly the same time (Santrock, 2001, pp. 41-68).

Starting Age for School

With those developmental theories in mind, parents often question if their children are ready to start kindergarten, especially when their birthdates are close to the cut-off date for entering into school. The topic comes up even more frequently when the children are boys or when there are behavioral concerns. Research indicates that these children are referred for special education at a higher rate (Hughes, 2017; Wallingford & Prout, 2000). Several studies advocate for the benefits of students delaying school-entry for one year, stating that it will give students extra time to mature (Maddux, 1980), delay the likelihood of needing special education services (Dhuey & Lipscomb, 2010), and that test scores are boosted for older students (Datar, 2006). Psychosocial functioning can also benefit from the extra year of growth (Bolger, 2018). On the other hand, some researchers advocate for students starting as soon as they are eligible, citing statistics around lower math grades for redshirted students (Speziale, 2011), increased chance of dropping out of high school (Lincove & Painter, 2006), higher chance of being diagnosed with a learning disability (Weiss, 2009), and overall lower achievements (Fortner & Jenkins, 2018).

Other factors

Retaining students, or having students repeat a grade, also needs to be considered. While it was more popular long ago, students are still being retained in an effort for them to catch up on academic content. However, results are consistent that retention does not lead to higher academic achievement, that retained students are more likely than on-time students to need special education services, and that they perform less well overall (Graue & DiPerna, 2000; Jimerson, 1999). In addition, research indicates that male students, younger students, as well as those from lower socio-economic status are more frequently redshirted (Greenburg & Winsler, 2020). Students who qualified for free and reduced lunch AND were retained had a higher chance of being placed in special education (Raffaele Mendez, Kim, Ferron, & Woods, 2015).

Theoretical Framework

Students born in the months directly preceding the cut-off date for entering kindergarten have higher referrals rates for special education (Wallingford & Prout, 2000). Some suggestions for alleviating this issue are delaying the start of kindergarten or retaining students, with research divided on the benefits (Bolger, 2018; Datar, 2006; Dhuey & Lipscomb, 2010; Fortner & Jenkins, 2018; Lincove & Painter, 2006; Weiss, 2009). However, some argue there are different reasons for the “summer birthday effect.” For example, Elder and Lubotsky (2009) indicated that the experiences students have prior to joining kindergarten are a big precursor for success. They see higher success for students from higher socio-economic backgrounds, indicating that these students had easier access to additional help to prepare them for kindergarten. Polizzi

et al. (2007) discussed prenatal biological factors as potential contributing factors for the higher referral rate for students with birthdays in the summer months. Seasonal lower access to sun and daylight during the midgestational period of the pregnancy may impact the development of summer babies.

Rationale

A disproportionate number of students with summer birthdays, or those born right before the cut-off date for entering kindergarten, end up being referred for special education evaluations (Wallingford & Prout, 2000). We know that students from lower socio-economic backgrounds and males are more likely to be referred (Greenburg & Winsler, 2020). We also learned that relatively young students tend to perform less well on academic assessments, as well as emotionally (Barnard-Brak et al., 2017; Bedard & Dhuey, 2006; Erion, 1987; Maddux, 1980; Menet et al., 2000; Oshima & Domaleski, 2006). Students with summer birthdays are more likely to be diagnosed with ADHD, especially when they enter school on time (Barnard-Brak et al., 2017). Delaying school by just one month can decrease the likelihood of being diagnosed with a learning disability by five percent (Dhuey & Lipscomb, 2010), yet we also know that there can be drawbacks for redshirting, and retained students tend to underperform and are still more likely to need services (Fortner & Jenkins, 2018). As educators, we need to be equipped to help our families navigate difficult decisions around enrolling their children in school. What are their options? When parents suspect a disability, is there any value in delaying the start of kindergarten? Does the specific disability or area of concern

make a difference? These answers are not readily available for educators, which makes an overview of the existing literature imperative.

Definition of Terms

In this thesis, several operational terms will be used. They are defined below.

Academic redshirting (redshirting) is the voluntary delay of school entry (Graue & DiPerna, 2000). This term is used interchangeably with delayed entry. Retention is when a student repeats a grade rather than being promoted to the next grade with their same-age peers (Graue & DiPerna, 2000). Relative age is the age of a child compared to the other children in their class (Menet, Eakin, Stuary, & Rafferty, 2000). Summer birthday is when a student's birthday occurs within the months of June, July, and August.

Research Focus

This thesis attempts to answer the question if there is a correlation between a student's birthdate, age upon entry into kindergarten, and the potential need for special education services while in elementary school. There is a large body of research focused on academic redshirting, early academic performance, and the impact of relative age on students. Studies discussing the impact of academic redshirting, performance, and relative age without discussing or focusing on special education were not included in this review.

CHAPTER II: LITERATURE REVIEW

Literature Search Procedures

To locate the literature for the thesis, searches were completed via the Bethel University Library and the following sources: EBSCO Megafire, ERIC, Academic Search Premier for literature in the content area, regardless of publication date. In addition, Google search engine was utilized to find full text versions of some articles and for additional international source materials. Results were narrowed to include only those empirical studies that were published in peer-reviewed journals. Keywords used to find results included "academic redshirting," "delayed kindergarten entry," "special education and summer birthdate," and "impact of birthdate on special education needs." The structure of this chapter is to review the literature on the impact of relative age when entering Kindergarten in terms of the need for special education services in four sections in this order: background, mixed results, the impact of race, gender and socioeconomic status, and delayed entry versus retention.

Background

The impact of a students' age starting kindergarten has been a subject of research for a long period of time. The research has led to mixed results. While certain studies indicate the benefits of a delayed start to Kindergarten, other research states delaying can be harmful. In addition, research has been done that shows differences between delayed entry versus retention, as well differences between gender and socioeconomic status. Before we review this specific research, we will review several

studies that highlight the differences between the oldest and youngest students in a grade.

Wallingford and Prout (2000) researched the possible effect of age within a grade in relation to special education referral. They collected archival data for the 1995-1996 school year. The data consisted of special education referrals within an urban/suburban school district in the southeastern part of the United States. Roughly 74% of the 33,000 students were Caucasian, and 23% were African American. The focus was on the elementary population (16,379), and specifically the 1,222 who were referred for special education. Students were assigned to categories based on their birth months, gender, as well as their age at the time of the referral. Age groups were defined based on designated birthdate parameters. Students born in June, July, August, and September (months six to nine) were considered the youngest students, while those born in October, November, December, and January (Months 10 to one) were considered the oldest. This is based on the September 30 enrollment cut-off date (Wallingford & Prout, 2000). Results of the research indicated that there is a significantly higher special education referral rate for students in the month six to nine group for five- to seven-year-olds, but that this difference disappeared for the students older than eight. The authors concluded that perceived performance deficits in younger students could lead to over-referral to special education services when the cause of the deficit can be temporary difficulty with the curriculum due to young age (Wallingford & Prout, 2000).

In contrast to Wallingford and Prout (2000), Diamond (1983) concluded that the birth rate effect for students in Hawaii is more stable into later years.

He researched Hawaiian public-school students during the 1979-1980 school year. A total of 154,203 students between the ages of five and 20 were included. Students were categorized based on their birth month. Results indicated that birthdate effect has an impact beyond the early years. He theorized that this might be due to the nature of the study, which researched ongoing special education classification, as opposed to referral only, as was done in previous studies. The author suggested that perinatal disease, as well as the season of the year during pregnancy may impact nutrition (Diamond, 1983).

Polizzi, Martin, and Dombrowski (2007) conducted research on the impact of the season of birth on emotional behavioral disorders (EBD). In order to do so, they looked at the data for 8,578 public school students receiving special education services in Georgia. These students were born between September 1983 through August 31, 1994. They reviewed the data over the 10-year span, using time series analysis, to see if cyclical patterns existed where the rate of EBD classification was higher for students born during certain months of the year. African American and European American students qualifying for special education services under the EBD label had statistically relevant fewer birthdates in the months of September and October, and more birthdates than expected in May, June, July, and August (Polizzi, Martin, & Dombrowski, 2007). The researchers concluded that the existence of the cyclical pattern indicates that seasonal differences need to be considered and that they may play a part in the students' struggles (Polizzi et al., 2007).

In 2000, Menet et al. conducted research looking at the effect of birth month on not only behavior, but also literacy, as well as referral to educational psychology services. This study focused on 695 students from two large schools in Northern Ireland in years one, three, and five. T tests were used to look at a possible correlation between birth month and the aforementioned measures. The researchers found that younger students in a grade produced lower mean scores when tested on letter and word recognition in year one. In addition, the younger group also scored lower on the behavior skills. For year three and year five students, younger students had lower mean scores on reading and spelling tests as well as on the behavior scales (Menet et al., 2000). The researchers noted the alarming trend of lack of maturity being interpreted as misbehavior, whereas the data indicates that younger children in a grade are performing at a lower level due to their relative age. This trend was also seen in referrals to free psychological services, where younger children in a grade were referred at a significantly higher rate than their older counterparts (Menet et al., 2000).

Bedard and Dhuey (2006) found that the youngest students in a grade scored significantly lower on national standardized tests than the oldest students in the grade. For example, the youngest students in fourth grade scored between 1.2 to 3.5 points lower (with a mean of 50 and a standard deviation of 10) when compared to the oldest students in that grade level. They reviewed the 1995 and 1999 Trends in International Mathematics and Science Study (TIMSS), the National Education Longitudinal Study (NELS), and the Early Childhood Longitudinal Study (ECLS). The purpose of the study was to see if relative maturity effects perpetuate into the teenage years and beyond. The

study comprised third and fourth-grade students from ten different countries and seventh and eighth-grade students from 18 different countries. Excluding students for whom birth month and year, test year, test month, and sex were not known, the overall sample size was 225,772 students (Bedard & Dhuey, 2006). Results of their research indicated that while there was a slight decline in relative age advantage between grades four and eight, it was still significant. Older students in the grade scored between 0.8-2.6 points higher on national standardized tests than the younger students in the grade. This translated to a 2-9 percent difference. According to the researchers, these results were consistent into adolescence and beyond, as evidenced by an underrepresentation of relatively young students among SAT and ACT takers (-7.7 percent), as well as an underrepresentation in those enrolled in four-year accredited colleges and/or universities (-11.8 percent) (Bedard & Dhuey, 2006).

Erion (1987) researched the correlation between chronological age, immaturity level, and the frequency with which learning disabilities are identified. He examined 67 children (in first through sixth grade) in the Oil City Area School District who participated in the Learning Disabilities Program. In order to be included in the study, students met two different criteria. First, they were experiencing significant underachievement per the learning quotient method. This method calculates mental age based on scores achieved on the Developmental Test of Visual Motor Integration and the Bender Visual Motor Gestalt Test. Students qualified by scoring below 89 percent. Second, students met criteria who scored below a recommended cut-off point on the Goldman-Fristoe-Woodcock Test of Auditory Discrimination (Erion, 1987). Results showed there was a

significant relationship between the incidence of learning disabilities and chronological age among participants (Erion, 1987). He argued that maturity might be the cause, mainly due to ruling out mental age as a factor (as per the participation criteria). In addition, results showed a much higher ratio of boys in the learning-disabled group than girls. Furthermore, in the two years following initial data collection, 58% of the students in the learning-disabled group were mainstreamed successfully into general education classes, almost all by repeating at least one grade. The handful of students who did not repeat a grade level were all mainstreamed by 10th grade (Erion, 1987).

A 2012 study analyzed the records of a rural North Carolina county during the school years spanning 2007 to 2010. The 206 students included were divided by their age at their entry into kindergarten into early, on time, and late entrants. A number of redshirted students (those who were held out of school for a year even though they were academically eligible) were also included. The purpose of the study was to research any possible correlation between date of birth and likelihood to be referred to and/or placed in the district's exceptional children's program (special education). The researcher used logistic regression for this study (Jordan, 2012). Statistically relevant relationships were found between race and age at referral and race and low socioeconomic status. In addition, statistically relevant relationships existed between age at kindergarten entry and referrals as well as kindergarten entry age and the number of retentions. Children from the early entry group were found to be nine times more likely to be placed in the exceptional children's program than other kindergarten students. Interestingly enough, redshirted students were three times more likely to be

placed in the exceptional children's program than those entering late, but still 6.5 times less likely than early entrants (Jordan, 2012).

In 1994, Buysse and Bailey Jr. conducted research to examine the possible correlation between certain child characteristics and placement into inclusive versus specialized early childhood programs. They looked at potential individual differences in severity of the disability, chronological age, functional and behavioral characteristics, and developmental status. The study included 162 North Carolina residents enrolled in center-based early childhood programs. Of the 162 children, 69 were enrolled in 11 different specialized programs. The remaining 93 were enrolled in inclusive programs, where they received special education services via eight different types of early intervention programs. The researchers used the Batelle Developmental Inventory (BDI), as well as the ABILITIES index. Behavioral characteristics were assessed via the Carolina Record of Individual Behavior (CRIB) (Buysse & Bailey Jr., 1994). A multivariate analysis of variance (MANOVA) was performed, taking all researched characteristics into account (severity of the disability, chronological age, BDI total age equivalent, participation, responsivity, and communication). The MANOVA resulted in significant differences between the specialized and inclusive programs. Predicted mean scores for students in the specialized programs were lower than students in inclusive programs. Relative age was not a significant factor for students with moderate to severe disabilities. While these results were not surprising, the researchers stated, based on anecdotal evidence and parental beliefs, that inclusion opportunities were limited for preschool-age children with moderate to severe disabilities (Buysse & Bailey Jr., 1994).

Verachtert, De Fraine, Onghena, and Ghesquière (2010) researched the relationship between season of birth and academic achievement in Flanders, Belgium, characterized by grade retention and differing levels of math achievement at the beginning of first grade. Data from a longitudinal survey was used. The SiBO followed a single cohort of students from the beginning of Kindergarten through sixth grade, starting in 2002. One hundred twenty two Flemish primary schools were included in the original study. Three thousand nine hundred ninety total students were in first grade during the school year 2003-2004 and were included in the present study. The Flemish cut-off date to start school is December 31, making students born in the fourth quadrant of the year (October-December) the relative youngest in their grade. Analysis showed that 20% of these students were retained or referred to special education by the end of the second-grade school year. In comparison, only 6.34% of students born in January, February, or March were retained or referred to special education (Verachtert, De Fraine, Onghena, & Ghesquière, 2010). When analyzing mathematics achievement at the start of first grade, relatively older children showed moderately higher achievement, but it was also indicated that this gap between first and fourth quadrant students narrowed significantly during the following two school years. Children who were born in the last two quarters of the year (and therefore the younger students in the grade) showed significantly faster growth in mathematics achievement than those born in the first quarter (Verachtert et al., 2010).

Goodman, Ford, and Gledhill (2003) researched if younger children within a school year were at an increased risk of emotional and behavioral issues. They analyzed

a community sample of English, Scottish, and Welsh students between the ages of five-15 years old. Over 10,000 participants were included. Psychopathology questionnaires were completed by teachers, parents, as well as 11–15-year-olds. The results were clinically reviewed. It was concluded that younger children in a school year were at a slightly higher risk for psychiatric disorders than older students. Adjusted regression coefficients were 0.51 according to the teacher report, and 0.36 based on the parental report. The adjusted odds ratio, when taking decreasing relative age in the grade into effect is 1.14. Results were consistent across different raters, age bands, and across different measures. The researchers' analysis supported the notion that the increased risk was due to relative age in the grade, as opposed to a 'season of birth' explanation (where all students born at a certain time of the year are at a disadvantage due to biological impact of the season on pregnancy). This theory was supported by the seasonal variation in risk that was evident (Goodman, Ford, & Gledhill, 2003).

In 2013, Dragoo researched if there were any predictive factors and characteristics for children receiving services in special education. The study looked at those who received special education services to see what factors contributed to discontinuing services prior to eighth grade. He used data from the Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K). Specifically, a sub-sample was used to answer the research question using chi-squares and t-tests to analyze the differences between children who remained in special education versus those exiting by the eighth grade. Logistic regression analysis was used to examine behavior, background characteristics and academic achievement as a predictor for being in special education

(Dragoo, 2013). Results from the study indicated not only that many children exited special education before reaching eighth grade, but that the children who did exit differed in characteristics from the peers who continued to receive services. He determined that those exiting were more likely to never be retained, to have changed schools at least once, to live in the southern part of the United States, and to live in the suburbs. The most significant factor that he determined was when services were initiated. Students receiving services by third grade were less likely to ever exit special education (Dragoo, 2013).

Oshima and Domaleski (2006) used the same ECLS-K data to conduct research in the academic achievement of students based on their relative age. The authors of the study identified 3,862 as younger (with birthdays falling in the summer months of June, July, and August) and 2,693 students as older (with birthdays in the fall months of September, October, and November). These students' performances on reading and math were examined using a cross-sectional study. From students in kindergarten through fifth grade, age was a significant predictor for performance, with the older students outperforming the younger students in both subjects. Another interesting factor noted is that race and gender were also predictors for performance. As students moved into higher grades, race and gender took on more predictive factors than age (Oshima & Domaleski, 2006).

In 2017, Hughes conducted research analyzing the impact of a student's age at the point of entry on academic achievement in the third grade. He looked at 1039 third-grade students who participated in the 2014 Pennsylvania State System of Assessments

(PSSAs). Five different suburban school districts were represented in the study, which conducted a three-way analysis of variance (ANOVA) to determine correlations between independent variables such as socioeconomic status, kindergarten entry age, and sex, and dependent variables of PSSA math and reading scores. Following that, a logistical regression analysis was conducted to review potential relationships between the independent variables and special education status (Hughes, 2017). Results indicated that while there was a significant relationship between kindergarten entry age and PSSA reading scores, that relationship did not exist for math scores. However, socioeconomic status did have a predictive relationship with PSSA math scores. Additional results indicated that there was no significant correlation between special education status and kindergarten entry age, even though he hypothesized that this correlation would exist. He did find significant predictive relationships between both sex and socioeconomic status and the likelihood of students being in need of special education services by the time they reached third grade. Male students and students from lower socioeconomic backgrounds had a higher likelihood. Being female decreased the likelihood by 49%, and students from a lower socioeconomic status had almost double the chance of needing services (Hughes, 2017).

Layton, Barnett, Hicks, and Trena (2018) looked at data to determine if younger children in a school grade cohort were more likely to be diagnosed with attention deficit-hyperactivity disorder (ADHD) due to behaviors that, instead of younger age, were attributed to ADHD. They pulled data from a large insurance database covering data from 2007-2015. Students born in the month prior to the cut-off date for

Kindergarten entry (August) were compared to those born in the month after the cut-off date (September). Data were included for the 18 States in the US that use turning five by September first as the cut-off date for eligibility for entry into Kindergarten.

Multivariable linear regression was used to analyze the rate of ADHD comparing students born in August and September. Statistical differences were evaluated using t-tests (Layton, Barnett, Hicks, & Jena, 2018). Analysis indicated that students born in August were significantly more likely to be diagnosed with ADHD than their counterparts born in September, and they were more likely to receive medical treatment for their diagnosis. The study concluded that a child's age could affect the likelihood of an ADHD diagnosis and subsequent treatment (Layton et al., 2018).

Barnard-Brak, Stevens, and Albright also researched the impact of academic redshirting on students with ADHD (2015). ECLS-K data was used for 21,409 students starting kindergarten in 1998-1999. Of these students, 1,057 were diagnosed with ADHD. Of this subset, parents of 426 students reported that their children were taking medication, 631 reported they were not. Students identified as having ADHD were more likely to be redshirted than their peers without an ADHD diagnosis. The researchers' analysis uncovered that redshirted students with ADHD who were taking medication appeared to have lower academic achievement when tracked over time, especially in the area of math. Their unmedicated redshirted counterparts showed increased math achievements, but there were no significant benefits in the area of reading (Barnard-Brak & Stevens, 2015). They also indicated that students who were medicated had more symptoms of inattention and were more frequently redshirted. Overall results indicated

that students who were redshirted by their parents did not benefit substantially from this decision when compared to students with ADHD who were not redshirted.

However, the social emotional benefits of redshirting were not taken into account in the study, and there may be benefits for students with ADHD there, especially those with more symptomatic cases of ADHD (Barnard-Brak & Stevens, 2015).

Mixed Results

As indicated earlier in the chapter, literature on the subject of the impact of kindergarten entry age is mixed. Several research studies were found indicating delaying entry is a positive move for parents and students, while other studies discussed the detrimental effects of doing so. Below I will discuss the studies on both sides of this argument, but first, one study had a different explanation for any perceived benefits for older children.

Elder and Lubotsky (2009) used ECLS-K and NELS data to look at the impact of kindergarten entry age on academic achievement. When reviewing the data, they concluded that the underlying reason for the effect of entry age was due to prekindergarten preparation. They stated that baseline models indicated that while fall reading and math scores were slightly higher for older children, due to the timing of the assessments, this impact was not due to any learning that had happened in school. Second, the researchers found that positive delayed entry effects were more pronounced and longer lasting for students from backgrounds with higher socioeconomic status. This pointed to increased access to educational opportunities during the redshirt year. Third, the research pointed to decreasing age impact as

children progressed through school. The benefits had disappeared by third grade for the poorest children and had mostly disappeared by eighth grade for the most advantaged children (Elder & Lubotsky, 2009).

Positive effects of delaying kindergarten entry

Bedard and Dhuey (2006), in an argument for delaying entry into kindergarten, concluded the effects of starting at a relatively young age could be long-ranging. Erion (1987) argued for the benefits of retention to negate the effects of starting too early. Articles reviewed in the 'redshirting versus retention' section of this chapter will expand on this argument.

Maddux (1980) researched the prevalence of relatively younger students in a group of learning-disabled children. Records for a group of 374 midwestern children labeled as learning-disabled were reviewed for educational history and birthdate. Students in the sample consisted of those from a rural background, mostly Caucasian, and predominantly from middle-class families. The students were divided into early, medium, or late entries. At least 92 of the students were retained at least once. Chi-square analysis indicated that entry age was important, and that students in the 'early' group were identified with learning disabilities at a rate higher than possible by chance alone. This disproportionality continued through ninth grade, but not beyond that into high school years (Maddux, 1980). Maddux concluded that maturational lag plays a significant role in identifying learning disabilities and suggested that parents and/or school districts consider delaying entry into school for those early entrants who show signs of immaturity (1980).

In 2010, Dhuey and Lipscomb researched the probability of students being classified as being disabled as it correlates to their relative age. Data was used from three nationally representative samples. This resulted in comparisons of similar questions being asked across different samples and across different age levels around childhood disabilities. The data spanning the years of 1988 to 2004 came from the ECLS-K, the National Education Longitudinal Study (NELS), and the Education Longitudinal Study (ELS). Results indicated that just one additional month of relative age decreased the likelihood of accessing special education services by up to five percent. This correlation was seen for learning disabilities, but not for other disabilities. They stated that the assessments used to identify learning disabilities did not take relatively young age into consideration. Age was a significant predictor up to 10th grade, the high end of the sample data included. This means that a fifth^{grade} student who was among the relative oldest in her grade was 33% less likely to be evaluated for special education services than her relative youngest classmate (Dhuey & Lipscomb, 2010). The authors concluded that the likelihood of students having a disability is equal, regardless of their relative age in their grade, but that the relatively young students are referred and assessed at a much higher rate, and that immaturity played a factor in this. The authors argued that the full impact of classifying relatively younger students with learning disabilities at a higher rate needs to be taken into account in terms of equalizing educational outcomes and was listed as an argument for delaying entry into kindergarten (Dhuey & Lipscomb, 2010).

Datar (2006), in turn, used the ECLS-K to research the impact of kindergarten entry age on elementary level academic achievement. He utilized instrumental variable (IV) estimates of entry age on kindergarten and first-grade test scores. In order to calculate entrance age, he looked at the number of days between a student's birthdate and the school's cut-off date for entry into kindergarten. He also took each state's kindergarten entry cut-off date into account (2006). Not only did analysis conclude that test scores were boosted significantly for those students entering a year older, but entering older also led to a steeper academic trajectory for the students' first two years in school. The benefits from delaying kindergarten entry were significantly increased for at-risk children, especially in the subject of reading (Datar, 2006).

In 2018 Bolger looked at the impact of school entry age on kindergarten students' psychosocial functioning. He asked teachers from a Northeast elementary school (housing students in grades K-2) to fill out the Strengths and Difficulties Questionnaire (SDQ). This rating scale looked at social-emotional areas such as conduct problems, hyperactivity/inattention, prosocial behavior, emotional problems, peer problems, and total problems. Of the total student population of 436, 92 parents consented to have the questionnaire filled out. This led to 29 kindergarten students, 36 first graders, and 27 second grade students being included. Of this group, 42 students were considered to be in the 'young' age group, and 50 were in the 'old' age group (Bolger, 2018). Based on the quantitative, cross-sectional design of the study, Bolger concluded that while younger and older students scored similar in the areas of conduct problems, peer relations, emotional problems, and prosocial behavior, there was a

significant difference between the groups in the area of hyperactivity/inattention. In this last area, students in the older age groups in kindergarten and second grades scored significantly lower on the teacher ratings. First-grade differences were not found to be significant. He stated that, for this small sample of students, teachers indicated lower impulsivity, better attention, and increased behavior control, which led to a conclusion that delaying entry for those younger students may have a beneficial impact (Bolger, 2018).

Negative Effects of Delaying Kindergarten

In 2011, Speziale researched the potential impact of chronological age differences on same-grade students in the area of math. He included 16,043 students from 40 Pennsylvania school districts in grades three, five, eight, and 11. All included districts identified September first as their cut-off date for entry into kindergarten, which controlled for the variability in entering dates. Information from the districts was then merged, ensuring the anonymity of students. Using quantitative analysis by using inferential statistics, differences in student performance on the PSSA math assessment among three separate groups of students were analyzed. The groups consisted of redshirted students (those with birthdays prior to September first who did not start school until the following year, making them the oldest in the grade), students born in September, October, or November who were eligible to start school in the following calendar year, and the youngest students in the grade (born in June, July, August) (Speziale, 2011). In all grade levels, students in Group one (redshirted) scored significantly lower on the PSSA math assessment than students in Groups two and

three. This result held, even after controlling for the number of students who were retained that were in the group. At less than 1% of all students in Group one, statistical evidence held that redshirted students performed worse on the assessments across all grade levels. Students from Group two, generally the older students in the grade, performed at a significantly higher level than the redshirted students. The analysis also showed that while younger students scored lower on their initial PSSA assessments (in grade three), their mean scores were comparable to Group two students in all ensuing grade levels. While many factors may exist why parents chose to redshirt their children, the author suggested that based on analysis, the potential benefits of increased physical and mental maturity did not outweigh the negative academic impact (Speziale, 2011).

Lincove and Painter focused their research on the long-term impacts of age at kindergarten entry. Using data from the 1988 NELS, they studied the educational and social outcomes as these redshirted students transitioned into college and the labor market. They also utilized surveys that were conducted with the participants, following up to 15,273 students to the age of approximately 26 years old (2006). Based on their longitudinal analysis, they found that redshirted students had fewer advantages than students with summer or fall birthdays. Analyzing the makeup of the redshirted group, it was concluded that the group included more males, had more students born outside the United States, and was more likely to include students from Asian or Latino backgrounds. These students more often had a nontraditional family structure. In addition, they discovered that redshirted students were twice as likely to drop out of school as students with a relatively young age. They had slightly lower test scores.

Younger students were least likely to have behavior trouble in high school, and redshirted students were most likely to be arrested. They concluded that at most, redshirted students lost out on a year of participation in the workforce without the benefit of an academic advantage (Lincove & Painter, 2006).

Weiss researched if certain kindergarten factors were predictive in identifying learning disabilities for students on an individual education plan (IEP) with at least one reading goal (LDR) in third and fifth grade. He used data from the ECLS-K to conduct logic analyses (2009). Even though he hypothesized that younger students would be more likely to be identified with an LDR in third grade, results indicated that being older at the start of kindergarten was a significant predictor for this. This result held true regardless of retention status in kindergarten. For students in fifth grade, being older at the start of kindergarten was still a significant predictor for being identified with an LDR. Students who were older when they entered kindergarten were indicated as more likely to be identified with a learning disability by grades three or five (Weiss, 2009).

The hypothesis that parents who suspect a developmental delay or disability may delay their child's entry into kindergarten was the premise for Fortner and Jenkins' research. They researched if the extra year out of school would be beneficial in terms of increased maturity and preparation for the demands of kindergarten (2018). They analyzed administrative records received from the North Carolina Department of Public Instruction (NCDPI) for the school years covering 2006-2007 through 2012-2013. Three cohorts of students were analyzed using regression analysis. Of the students included in the sample, 14.2% were identified with a disability in third grade. The 262,000 students

were divided into an on-time and a redshirted group. Reading and math scores on North Carolina's statewide End of Grade (EOG) assessments for third grade were used as dependent variables (Fortner & Jenkins, 2018). When compared to students who started kindergarten on time, achievement outcomes were significantly lower for redshirted students for most disability designations. The researchers stated this might be due to schools being able to provide early interventions as well as early identification. The only area where redshirted students outperformed on time students was for those with speech-language impairments. Overall, redshirting for students with (suspected) disabilities did not correlate with improved achievement, instead, redshirted students with identified disabilities in third grade scored lower on their EOG assessments than did students with identified disabilities who started kindergarten on time (Fortner & Jenkins, 2018).

A study by May, Kundert, and Brent focused on the correlation between delayed school entry and a decreased need for special education services. Three thousand two hundred thirty-eight students from a predominantly Caucasian, suburban New York school district participated in 1991. They collected data on race, date of birth, gender, current grade, any retentions, and if special education services were received (1995). This data was analyzed to see if a student's age upon kindergarten entry influenced any later retentions or placement in special education. Two hundred seventy-nine students had delayed entry, 415 were retained in grades one through five. Of the 279 students with delayed entry, six percent were later retained, and 17.5% were later placed in special education. The rate of special education services for non-delayed entry students

was seven percent. They concluded that while typically intended to benefit the student and prevent possible placement in special education, the delayed entry in this sample led to a 10.5% increase in special education placement (May, Kundert & Brent, 1995).

Gender, Race, and Socioeconomic Status

Several of the studies discussed previously touched on the differences in performance based on gender, race, and/or socioeconomic status. For example, Bolger's 2018 study looked at differences in functioning based on gender. The only area of significant difference was found to be in the hyperactivity/inattention domain, where males scored significantly higher on the SDQ. Females did score higher overall on emotional problems, peer problems, and conduct problems, while males scored higher in total problems, but none of the differences in these areas were in the significant range (Bolger, 2018). Lincove and Painter (2006) referenced that redshirted students tended to be male and from lower socioeconomic backgrounds. In addition, they stated that one in five girls who redshirt ended up dropping out of school before high school graduation. Hughes (2017) indicated PSSA math scores for economically disadvantaged youth were on average 130 points lower than those for students from middle- or upper-class families. Hughes concluded that while kindergarten entry age was not a significant predictor for the need for special education services by third grade, being male and from lower socioeconomic was (2017). Datar's 2016 research stated that disabled and poor children (especially boys) benefitted significantly from delayed entry into kindergarten. Specifically, reading scores were positively impacted by redshirting for these groups (2016).

One of the earliest research papers identified on this subject was written by Wallin, who researched differences in mental capacity, chronological age, and sex ratios of children referred to special education classes (1930). The author reviewed data on 4,663 children referred for special classes from a large number of schools in Ohio and Missouri. During that time, principals had to recommend one percent of all students twice a year for referral, who were then eligible to be evaluated by psycho-educational clinics. While awaiting evaluation, these students were frequently placed in classes for backward children (Wallin, 1930). He inferred guidelines for referral were not always followed. Children were referred for reasons other than 'mental backwardness'; however, overall criteria were uniform, and therefore were representative for his study (1930). At the time this research was published, classes were separated between regular and special (or ungraded) classes. He was surprised that many students were not evaluated until after they turned ten years old. He suggested the creation of a class for students awaiting their evaluation results. Research indicated that boys were referred for evaluation at a younger age than girls and much more frequently (66% of referrals were for boys). Some of the reasons mentioned for this discrepancy was that parents and teachers were unwilling to face the issue of girls being considered deficient, and, even when they were, girls did not cause the disciplinary problems that boys did, which made it easier for them to remain in regular classes. Lastly, since girls were more likely to enter into non-competitive service within their homes, as opposed to the competitive job market for boys, there was less concern about their education (Wallin, 1930).

Greenburg and Winsler conducted research looking at the prevalence of delayed entry into kindergarten among ethnically diverse and low-income children and the impact this had on the need for special education services (2020). In order to do so, they used 30,967 participants from the Miami School Readiness Project (MSRP). 78% of this sample consisted of students eligible for free and reduced lunch, 57% were considered English Language Learners (ELL), 52% were male, 35% were Black/African American, 57% were Hispanic/Latino, and the remaining 8% were White, Asian, or Other. Only one percent of the students in the sample (305 students) delayed entry into kindergarten. The researchers used a hierarchical logistic regression model to predict delayed kindergarten entry. Bivariate tests indicated that students in poverty, native English speakers, younger students, those attending center-based childcare, and boys were more likely to delay entry than any other group. The students in this group tended to have lower skills in the areas of language, cognition, social behavioral, and fine motor (Greenburg & Winsler, 2020). When looking at the need for special education services, 27.2% of the 305 students in the delayed sample accessed services, whereas only 12.5% of on-time students received special education services. They indicated poorer school readiness skills might be a predictor for this. In addition, boys were found to delay entry at a higher rate than girls (Greenburg & Winsler, 2020).

Raffaele Mendez et al. studied the long-term impacts of children who were either retained in kindergarten or who had delayed entry. They analyzed data from a large, urban, Floridian school district. Students were divided into three groups: typically progressing (6,273 students), delayed entry (134 students), and retained students (434).

Propensity score analysis (PSA) was used to examine long-term outcomes for students in the three groups (2015). In terms of ethnic and socioeconomic distribution, the typically progressing and delayed entry groups showed similar trends, while the retained group consisted of more students from minority groups and those qualifying for free and reduced lunch. When looking at the students who qualified for free and reduced lunch, retained students from this group were more likely to be placed in special education than delayed entry students (Raffaele Mendez, Kim, Ferron, & Woods, 2015).

Delayed Entry Versus Retention

It is important to touch on the subject of delayed entry versus retention. Some studies discussed the negative impacts of students being retained. For example, Jimerson studied the longer-term impacts of early grade retention on students. One hundred ninety children who participated in the Minnesota Mother-Child Interaction Project were selected for the study. The MMCP followed at-risk students and their families for 21 years. The study analyzed students who were retained once in grades kindergarten through third. Assessments for the MMCP included child interviews and testing, teacher interviews, and mother interviews and testing (1999). Results indicated that students who were retained during their early school years were more likely to drop out of school by age 19, had lower levels of academic adjustment by the end of their junior year in high school, and were less likely to be enrolled in a postsecondary educational program. In addition, these retained students ended up with a lower wage per hour and with poorer employment competence ratings (Jimerson, 1999).

They indicated that teacher perceptions for retained students were less favorable than students in the typically progressing or delayed entry groups. They also concluded retained students had a higher chance of being placed in special education than delayed entry students and a higher chance of being identified by their teachers as having difficulty paying attention. Both delayed and retained students had a higher chance of being summer babies, and by grade five, teachers had more favorable ratings on school attitude for delayed entry students. Delayed entry students tended to perform better on standardized tests (Raffaele Mendez et al., 2015).

Graue and DiPerna researched the prevalence of redshirting, its impact on students, and the differences between redshirting and retention. They analyzed data for 8,000 public school students from several school districts in Wisconsin. Of the 8,000 students, seven percent had delayed entry into kindergarten, with higher rates of boys whose birthdays fell immediately prior to the entry cut-off date. Children of color and those from a lower socioeconomic status had a higher rate of being retained by third grade (2000). Analysis showed that both redshirted and retained students experienced greater participation in special education services than peers who entered on time. Redshirted students were 1.89 times more likely to need services, in comparison to 2.76 times more likely for retained students. In addition, retained students performed less well overall than their on-time and redshirted peers (Graue & DiPerna, 2000).

CHAPTER III: DISCUSSION AND SUMMARY

Summary of Literature

Several studies confirmed that students with summer birthdays, who are the younger students in their grades, had a higher special education referral rate than their relatively older peers (Diamond, 1983; Jordan, 2012; Verachtert et al., 2010; Wallingford & Prout, 2000). More specifically, a number of studies stated that younger students had an increased chance of being diagnosed with an emotional behavioral disorder (Polizzi et al., 2007), psychiatric or psychologic disorders (Goodman et al., 2003; Menet et al., 2000), or with ADHD (Layton et al., 2018). In addition, negative impact on academic performance was noted as evidenced by lower scores on standardized assessments in the areas of reading and/or math (Barnard-Brak et al., 2017; Bedard & Dhuey, 2006; Erion, 1987; Maddux, 1980; Menet et al., 2000; Oshima & Domaleski, 2006). In contrast, one study concluded there was no correlation between kindergarten entry age and special education status, but that correlation was found between gender and socioeconomic status with males and those from a lower socioeconomic status have an increased chance of being identified (Hughes, 2017). Different research concluded kindergarten entry age did not make a difference for students with moderate to severe disabilities (Buysse & Bailey Jr., 1994), while another set of researchers concluded the entry age effect was caused by prekindergarten prep due to students from higher socioeconomic status having increased access to educational opportunities (Elder & Lubotsky, 2009). Students already receiving services by third grade were less likely to ever exit from special education services (Dragoo, 2013).

Students who reach minimum age within three months of the kindergarten cut-off date can benefit from choosing to delay entry by one year (redshirting). There was evidence of lowered identification of learning disabilities (Maddux, 1980), boosts in test scores (Datar, 2006), and increased functioning specifically in the area of hyperactivity and inattention (Bolger, 2018). One study stated that delaying school entry by just one month decreased the likelihood of being identified with a learning disability by five percent (Dhuey & Lipscomb, 2010). In contrast, research also indicated that delaying school entry led to significantly lower achievement outcomes (Fortner). Redshirted students had lower test scores (Speziale, 2011), were twice as likely to drop out of high school (Lincove & Painter, 2006), and had an increased chance of being identified with a learning disability (Weiss, 2009). Delaying kindergarten entry led to a 10% increased likelihood of accessing special education services (May et al., 1995).

When looking at gender and socio-economic status, research confirmed that males were both referred (Wallin, 1930) and delayed (Greenburg & Winsler, 2020) more frequently. Research also stated that delayed students were more likely to be in poverty, native English speakers, in the younger age group, and boys. These delayed students were 15% more likely to be referred for special education services (Greenburg & Winsler, 2020). Students who were retained and were eligible for free and reduced lunch had an increased chance of being placed into special education (Raffaele Mendez et al., 2015). Redshirted students tended to perform better academically than students who were retained. These students also have a higher chance of needing special education services (Graue & DiPerna, 2000; Jimerson, 1999).

Limitations of the Research

In order to focus on the research question of this literature review, results not specifically discussing special education referrals or services were excluded. Research discussing only the impact of lower socio-economic status on educational performance was excluded. Many articles were found discussing the need for differentiation in classrooms based on chronological and emotional age. While this is valid research and the strategies explained are useful in addressing some of the concerns with the higher rate of special education referral for relatively young students, they were outside of the scope of this specific thesis.

While looking for articles, I was expecting to find more research in the area of advice geared to parents. The focus for all articles was on the implications for teachers and school districts from the entry point into kindergarten, but no specific research was done to discover any correlations between what happens in the preschool years and school readiness. No research was found that addressed what parents can do during a redshirt year to help their child be more prepared for kindergarten.

Implications for Future Research

No research was found combining the impact of chronological and emotional age, and what strategies are successful in preventing students from needing to access special education services. In addition, while the different studies included in this literature review are described as giving 'mixed results,' results are fairly consistent when looking at specific data points. Research including these nuances will lead to knowledge that parents and educators can use when making educational decisions.

Implications for Professional Application

The original inspiration for this thesis came from reviewing students on my caseload over the past few years. I started noticing a pattern of many special education students who were relatively young. Was there a correlation between the students needing services and when they were born? Could simply staying home an extra year to grow and mature be an answer to the rising need for services? I was anticipating a clear-cut answer. Yes, research indicates academic redshirting is good, or no, it is not. I was disheartened while doing the research since the results were so mixed. However, once I started to delve into the details of the body of research out there, I realized the results are not necessarily mixed, but they lack nuance. For example, while delaying school for one year may be beneficial for ADHD students' social emotional development, there are no academic benefits (Barnard-Brak et al., 2017), or there is an impact on reading scores, but not math (Menet et al., 2000). Students with learning disabilities are more likely to be among the youngest in their grade (Erion, 1987), and delaying even by just one month can decrease the likelihood of qualifying with a learning disability by 5% (Dhuey & Lipscomb, 2010). Boys tend to have a higher rate of referral than girls (Greenburg & Winsler, 2020), and students in the southern part of the United States are more likely to exit from special education services (Dragoo, 2013). In order to help our students and advise our parents, we cannot look at a birthdate and give a recommendation on when they should start kindergarten. Instead, as in all other areas of education, we need to differentiate. Once we get to know our students and their birthdates, we need to accommodate what research has shown us. While we know that

standardized assessments that makeup part of the evaluation process do not typically account for relative age (Dhuey & Lipscomb, 2010), we should strive for making relative age and how it can impact a student's education journal a part of everyday classroom pedagogy as well as the intervention process. As we are programming for our students, we need to take into account that what we identify as 'behavior' may actually be age-appropriate, or a lack of maturity. In this case, instead of referring a student for an evaluation, we can make accommodations in the classroom and teach a student the necessary skills.

That being said, we also know that just delaying kindergarten for a year will not benefit those students who have moderate to severe disabilities, or those already receiving services prior to kindergarten. Delaying entry for those students has a negative impact, since it typically leads to a lack of services and interventions (Buysse & Bailey Jr., 1994). What we can focus on instead is helping parents realize that what happens during the redshirt year is important. What educational opportunities are they exposed to, and what activities are they involved in that will help their social emotional development.

We may want to consider creating a type of checklist that parents can reference as they are in the process of making the decision to enroll a summer baby into kindergarten. In addition, we want to think about who those families typically talk to. What information does the personnel in the main office of a school building have access to help parents make informed decisions? Parents are smart. If they sense there is an issue with their child, simply delaying a year will not make that issue go away. We also

want to avoid having students who are not ready start too early, since perceptions of retained students are more negative than redshirted students. We want to ensure parents that we are here to support them either way, and that we have interventions in place for all students that take relative age into effect and that help them be successful.

Conclusion

Is there a correlation between a student's age upon entry into Kindergarten and the potential need for special education services while in elementary school? After reviewing the body of research, I can confidently state that "it depends." It depends on the student, on the disability, gender, and socioeconomic status, and yes, it depends on when the student was born. While there is no definitive answer possible to the initial research question, we have learned that while relatively young age can have an impact on a student, delaying entry into kindergarten is not a fix-it-all, and while beneficial for students with specific learning disabilities, it may be detrimental for students with moderate disabilities, or those with emotional behavioral disorders or ADHD. It is up to us to create a culture where parents can come to their school and ask for help in making that decision, and up to the school to realize that relative age plays an important part in how a student performs during those early elementary years.

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