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Assessing the Grade Retention Outcomes among Children with Speech and Language Disorders (SPLD) Using the National Survey of Children's Health, 2016-2021

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ABSTRACT

Assessing the Grade Retention Outcomes among
Children with Speech and Language Disorders (SPLD) Using the National Survey of Children's Health, 2016-2021

By

CALEB J. KING

MAY 2nd, 2023

INTRODUCTION: Grade retention is designed to give children who appear to be falling behind a chance to catch up and meet the requirements for their grade level, so that the child has an opportunity to meet the academic level needed to advance. Historically, students at the highest risk for being retained have the following characteristics: male, African American or Hispanic, developmental delays, reading problems, difficulties with peer relationships, speaking a language other than English and other determining factors. In 2015, the U.S Census Bureau estimated that Hispanic and Black students are one- and one-half times more likely to be retained than White students, but little research has been conducted to see if this disparity exists amongst children with speech and language disorders (SPLD). **AIM:** The aim of this study is to investigate the relationship between racially diverse children who have speech and language disorders (SPLD) and their likelihood of being retained a grade in primary and secondary education. **METHODS:** Data from 2016-2021 National Survey of Children's Health will be used to conduct a logistic regression analysis. The predictors selected for my models are the following: gender, race/ethnicity, parental education, income level, language use, and history of special education and/or speech therapy. Since grade retention is being assessed, children who are less than 5 years of age were excluded. **RESULTS:** Logistic regression models showed that there was a statistical significance between the presence of a SPLD and grade retention. Odds ratios were translated by using Cohen's d (0.2 = small; .5 = medium; .8 = large) translation to 0.2 ~ OR = 1.54; .5 ~ OR = 2.83; .8 ~ 4.95) to indicate the extent of the interactions. For example, children with a SPLD had 3.36 times the odds of being retained relative to children who do not have a SPLD, so there was a moderate, but significant association present.
DISCUSSION: While overall grade retention rates have decreased over time, disparities remain amongst racial and ethnic populations, particularly for children with SPLD. This study revealed that children with SPLD have an increased likelihood of being retained. Therefore, the results will inform speech language pathologists as well as teachers and school administrators about the academic performance of children with SPLD and to devise ways for them to succeed despite their communication difficulties. **KEY WORDS:** academic achievement, academic success, academic progress, grade retention, speech disorder, language disorder, bilingualism, language use, speech therapy, children

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B.S., KENNESAW STATE UNIVERSITY

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APPROVAL PAGE

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Author's Statement Page

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Caleb King
Signature of Author

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Chapter 1: Introduction

Communication skills are vital for every aspect of life but are particularly important for children who are beginning to learn how to read, write, and communicate effectively with their teachers and peers in school settings. When a child does not reach certain developmental milestones at a specific age relating to speaking and language use, this may be a sign of a communication delay or disorder. A communication disorder occurs when a person has significant difficulty in one or more aspects of communication when compared with other people sharing the same language, dialect, or culture (Justice, 2010). Communication disorders are categorized into four groups (speech disorder, language disorder, hearing disorder, and central auditory processing disorders), but this study will primarily focus on speech and language disorders (SPLD). A speech disorder is an impairment of the articulation of speech sounds, fluency, and/or voice, which hinders the production of speech sounds, flow/rate of speech, or the production of vocal quality (ASHA., n.d). A language disorder involves problems with the correct formation of words or sentences, the derivation of meaning, or the use of linguistic context and may affect expressive and receptive language as well as nonverbal such as developmental dyslexia (Newbury & Monaco, 2010). These disorders are diagnosed by speech and language-pathologists, also known as speech therapists, which are allied health professionals who prevent, assess, and treat speech, language, social communication, cognitive -communication, and swallowing disorders in children and adults (ASHA, n.d).

Nationally, the Center for Disease Control and Prevention (CDC) estimates that nearly 8% of children aged 3-17 years had a communication disorder during the past 12 months (CDC, 2015). Biological and socioeconomic factors can contribute to the development of a SPLD. Some biological factors include family history of SPLDs, male gender, and perinatal factors such as low birth weight (Nelson et al., 2006). Some socioeconomic factors associated with SPLD include social class, income, and a child's family dynamics (Schwab & Lew-Williams, 2016). Also, the onset of cognitive disabilities such as Autism or Attention-Deficit/Hyperactivity Disorder (ADHD) can also affect speech and language development (Lewis et al., 2012; Gernsbacher et al., 2016). Therefore, children who are diagnosed with a SPLD may have difficulty communicating with their teachers, reading levels are not meeting appropriate benchmarks, have trouble interpreting and responding to social cues, and have trouble expressing their thoughts and feelings through verbal and written communication (Burgoyne et. al 2019). In fact, these difficulties appear to be more pronounced among children who are bilingual and English learners (Tingle, Schoenberge, & Algozzine, 2012).

1.1 Grade Retention

Grade retention is designed to give children who appear to be falling behind a chance to catch up and meet the requirements for their grade level, so that the child has an opportunity to meet the academic level needed to advance (Lorence, 2006). This course of action is typically recommended when a student performs poorly on standardized tests, developmental immaturity stemming from learning difficulties such as reading differences or absenteeism, or students with adverse childhood experiences (e.g., exposure to violence or trauma) (Hinojosa et al., 2019; Henry et al., 2018). The regurgitation of instructional material may seem like the ideal

method to improve standardized test scores in some instances, but students who are retained are more likely to have a negative impact on their academic self-efficacy and motivation, interpersonal relationships, parents are more likely to have lower expectations for their child's academic achievement (Hughes et al., 2013). Lastly, students who are retained are more likely to drop out of school (Goos, Pipa, & Peixoto, 2021; Hughes et al. 2013).

In the early 1900s, grade retention was introduced as a proactive educational intervention to increase school-based outcomes, but it has received mixed results over time. Jimerson (2001) conducted a meta-analysis on grade retention studies published between 1990-1999 and found that 20% of studies revealed favorable outcomes. The predictors used in these studies were IQ, academic achievement, social emotional adjustment, socioeconomic status, and gender but these results were not definitive. Large effect sizes were seen across sample groups such as school attendance, reading, mathematics, language, and emotional adjustment. The smallest effect sizes were academic achievement and socioemotional/ behavioral adjustment, -0.39 and -0.22 respectively (Jimerson 2001). In other words, grade retention is not an effective intervention for academic achievement and socioemotional adjustment. Conversely, Allen et. al (2009) conducted a meta-analysis of studies published between 1990 -2007 challenging the common notions about retention, and its effects on academic achievement. Investigators concluded that earlier studies did not account for the effects of pre-retention differences of retained children and promoted children, which could have contributed to the inaccurate perception of grade retention. Pre-retention measures refer to the extent of achievement and ability; therefore, not accounting for non-equivalence in these comparison groups produced a negative result. More recently, Goos et al. (2021)

conducted a meta-analysis to assess the effectiveness of grade retention by grouping countries that have “high,” “low to moderate,” and “low” prevalence of retention rates. For example, France and Germany have high retention rates compared to low to moderate rates seen in the United States and Canada. The results of study found that an average of 35% of grade retention were significantly negative (favoring non-repeaters), 41% were non-significant, and 24% were significantly positive (favoring repeaters)**.** The mean effect size between repeaters and non-repeaters was -0.04, so it was concluded that grade retention had no negative or positive effects.

According to the National Center for Education Statistics (2019), the percentage of students retained in a grade decreased from 3.1 to 1.9 percent between 2000 and 2016. While grade retention rates have decreased over the last decade, disparities amongst racial and ethnic groups were found. 2.7% of Black students were retained in kindergarten through grade 12 compared to 1.7% of White students. Given the difficulties that children diagnosed with SPLD, educational outcomes can be further impacted as it relates to reading comprehension, language development, and taking assessments, but limited research has been explored among this school-aged population. In the event that a child’s disorder is not properly diagnosed or remedied, teachers or school administrators may inappropriately recommend that the child may need to be retained.

1.2 Intersection of SPLD and Race

The social determinants of health (SDOH) are defined as the conditions in the environment where people are born, live, work, play, worship, age that affect a wide range of health, functioning, and quality of life (CDC, 2022). Due to the prominence of SDOH, this can

significantly affect a child's speech and language development. For example, low socioeconomic families may not realize the importance of early language development and parental involvement with their child due to financial pressures and emotional distress (Conger et.al 2007; Volodina et. al 2022). In 2019, the U.S Census Bureau estimates that the median household income for Black households was $45, 438 compared to $56, 113 for Hispanic households, and $76, 057 for non-Hispanic White households. In addition to the structural inequities seen across the racial and ethnic groups, the demographic makeup of speech and language pathologists is predominately White. According to the American Speech & Hearing Association (ASHA's) 2021 Member and Affiliate Profile Report, 91.3% of speech-language pathologist identified as "White," 3.6% identify as "Black or African American," 3.1% identify as "Asian," and 1.5% identify as "Multiracial." Culturally and linguistically diverse children diagnosed with SPLD may encounter more difficulties with their dialect and vocabulary, but the lack of diversity in the speech-language profession could contribute to underutilization of services or overidentification of children who come from diverse backgrounds.

1.3 Intersection of Race and Educational Outcomes.

The United States has a long-standing history of marginalizing racial and ethnic populations due to unequal distribution of money, power, and resources (Schillinger, 2020). Access to a quality education is one of several determinants that contributes to obtaining optimal health (Assari et al., 2019). Education allows people to secure employment that pays well and to live in a safe environment. The Plessy v. Ferguson (1896) case was a landmark U.S Supreme Court decision that deemed racial segregation constitutional, and this led to the separation of Whites and Blacks in restaurants, neighborhoods, transportation, public schools, and other publicly-

accessed entities. Nearly sixty years later, the Brown v. Board of Education of Topeka (1954) overturned the racial segregation ruling in Plessy v. Ferguson (1896) and denounced that racial segregation of children in public schools was unconstitutional. While this ruling ended legalized segregation, schools were not integrated until many years later and the remnants of racial inequalities have caused disparities in educational outcomes. Educational gaps between White and Black populations have been seen, and this affects income levels, employment opportunities, and overall quality of life. Factors such as school performance and parental education increase a student's risk of being retained. Historically, minority children are more likely to be held back compared to their White counterparts. Between 2000 and 2016, there was a higher percentage of Hispanic and Black students than White students being retained, but the percentages of White and Hispanic students retained in 2016 were not measurably different (NCES, 2019).

1.4 Intersectionality Between SPLD, Race, and Educational Outcomes

Intersectionality is defined as the ways in which multiple marginalized or disadvantaged social statuses interact at the micro level of individuals' lived experience to reflect interlocking systems of privilege and oppression at the macro social structural level (e.g., racism, classism, sexism, ableism, and other forms of discrimination) (Alvidrez et al., 2021). Kimberle Williams Crenshaw originally coined this term to describe the racism and sexism experiences of Black women (Crenshaw, 1991). This study will use this theory to examine how intersecting identities impedes a child's academic performance. For example, a teacher may view a child differently because he or she is unable to separate a child's immigration status from their language disorder, which may lead to a discriminatory encounter. To prevent a child from having a

negative experience, teachers need to be able to incorporate inclusivity in their classrooms to serve all students appropriately, so that children who have intersecting identities have ample opportunities to thrive like everyone else.

According to Jimerson & Renshaw (2012), students at the highest risk for being retained have the following characteristics: male, African American or Hispanic, developmental delays, behavioral issues, difficulties with peer relationships, speaking a language other than English, reading problems, low socioeconomic backgrounds, and other determining factors. As previously stated, grade remediation is associated with negative effects on a child's social, educational, and emotional development. Therefore, this study will investigate the association between children who have SPLDs and their odds of being retained. It is important to understand the relationship between a child's racial and ethnic identity and presence of a speech or language disorder while considering a child's history of special education services, and language use.

1.5 Research Questions

(1) Do children with a speech or language disorder (SPLD) have similar chances of repeating a grade compared to children who don't have a SPLD?

(2) Are minority children with a SPLD at an increased chance of repeating a grade compared to white children with have SPLD?

(3) Are bilingual children with a SPLD at an increased chance of repeating a grade compared to monolingual children without SPLD?

The aim of this study will be to compare the odds of grade retention amongst children with SPLDs to children without SPLDs. This study also aims to disaggregate the data by race,

ethnicity, and language use to examine the odds of grade retention amongst minority children and white children based on the presence of SPLD. Bilingual children and monolingual children will also be examined under similar conditions. The purpose of this study is to inform speech language pathologists as well as teachers and school administrators about the academic performance of children with SPLD and to assess the racial inequities amongst this school-aged population.

Chapter 2: Theoretical Framework

The Transactional Model of Development was proposed in the 1970s by Arnold Sameroff, and he was interested in assessing how nature and nurture impacts the development of children. Thus, the Transactional Model of Development will allow investigators to examine the interactions between the individual and the environment. The foundational principle of the transactional model is that the contact between the individual and the environment is a transaction in which each is altered by the other, and this transaction impacts subsequent interactions in a continuous fashion (Jimerson, 1999). Researcher, Shane Jimerson has referenced this theory numerous times in his grade retention research as it pertained to academic, behavioral, and employment outcomes. This theory will give study investigators a reason to explore the educational experiences of children with SPLD by assessing a child's academic progress and determining how their racial and ethnic identity coincides with their communication ability. Considering that disabilities such as SPLD are already stigmatized, this creates a unique experience for minority children or culturally linguistic children, and these intersecting identities need to be further investigated. Therefore, the Transactional Model of Development provides a framework in understanding the transactional narrative in interpersonal and environmental factors that children with SPLD experience during their developmental trajectories. This framework has the potential to inform parents, caregivers, and teachers, so that children do not have long-term issues as they enter adolescence and adulthood.

Chapter 3: Literature Review

While academic success is an important measure to assess school's overall performance, structural disadvantages seen in educational policies and practices pertaining to academic outcomes and codes of conduct significantly affect the learning environment for minority students (Celeste et. al, 2019). Particularly, geographical factors have a profound impact on resource allocation in schools located in suburban, urban, and rural areas. Despite discovering differences in grade retention outcomes amongst communities of color in urban or rural settings, African American and Latino students have higher rates of grade retention regardless of location (Peguero et. al 2018). Harsh disciplinary policies have also attempted to target students of color and low socioeconomic status, leading to higher suspension rates in African American students. During the 2015-2016 school year, the U.S Department of Education's Civil Rights Data Collection revealed that African American students were three times more likely to receive an out-of-school suspension compared to White students. Out-of-school suspension negatively impacts academic performance and lowers test scores, thus increasing the likelihood of teachers and school administrators recommending grade retention. Due to the model minority stereotype, Asian American youth also suffer from societal pressures to maintain their "high achieving" persona, but Ngo and Lee (2007) argue that this stigmatization is inaccurate for individuals who identified as Southeast Asian. The aggregation of Asian population data has caused inequities to persist in Southeast Asians compared to other Asian subpopulations (e.g., Chinese, Japanese, Korean). Therefore, disaggregating data pertaining to academic performance could reveal more disparities within Asian and other racial/ethnic subgroups.

As previously stated, grade retention has a negative impact on adolescent's social and emotional well-being and occupational outcomes as they transition into adulthood. Jacob and Lefgren (2009) indicated that students who are retained are less likely to obtain a high school diploma. The work of Hughes et al (2018) concluded that the odds of African American children dropping out as a result of retention are six times greater compared to Whites. Based on the disparities seen in retention and dropout rates, study investigators can assume that school-aged children who have a speech or language disorder (SPLD) are an increased chance of poor school performance depending on their racial and ethnic identity. Specifically, children who are diagnosed with a speech or language disorder have difficulty in English and Mathematics, but limited research has been conducted to assess how these difficulties correlate to academic advancement. Wren et al. (2020) found that children who are eight years of age with persistent speech disorder (PSD) are more than three times more likely to score below target levels in English and 2.6 times more likely to score below target levels in Mathematics as they got older, specifically at age ten and eleven, in a United Kingdom population-based study called Avon Longitudinal Study of Parents and Children. In Malik et al. (2017) study, researchers further attest that students who have communication challenges have difficulty in active language areas such as reading and writing, and children with multiple SPLD affects their academic performance. While this study does not directly assess the risks of grade retention, these studies identify which subjects are most difficult for students with SPLD, which could provide some insights as to why teachers feel inclined to make these drastic recommendations. Furthermore, schools should attempt to provide additional services in areas where literacy development skills are needed. Lewis et al. (2015) found similar results comparing adolescent

outcomes of children with early speech sound disorders with and without language impairments. Alternatively, Farquharson and Boldin (2018) took a different approach to assess the educational outcomes of children with speech sound disorders (SSDs). Due to the Individual with Disabilities Education Act (IDEA), states and school officials have inconsistent qualifying guidelines about which students can receive school-based services (Farquharson & Boldini, 2018). For example, school-based speech language pathologists may not recommend speech therapy for students who are receiving good grades. To gauge the extent of a SLP decision-making skills, a national survey was administered a national survey, and results showed that 95% percent SLPs who completed the survey selected “oral participation” as an education performance factors, and “academic results/grades” were chosen least frequently, which negates the claim that having a SPLD does not affect academic performance (Farquharson & Boldini, 2018).

3.1 Disparities in Speech and Language Services. For children to receive special education for their SPLD, an evaluation must be conducted to approve the child for these intervention services. Public health researchers have shown that healthcare disparities related to access, utilization, and outcomes exist amongst racial and ethnic groups (Kim et al., 2018). Speech therapy is a common intervention service for children to improve their pronunciation, fluency, and speech production. Generally, minority children are less likely to receive speech therapy compared to Whites due to misdiagnosis, lack of knowledge about school-based services, and cultural sensitivity amongst physicians (Elliott et al., 2022; Morgan et. al., 2016). To assess speech therapy receipt amongst children with developmental disabilities, multivariable logistic regression models was used and found that the Hispanic patient population received speech

therapy at lower rates than White and Asian children; Black children have the lowest odds of receipt of speech therapy compared to Whites and Hispanics (Elliott et al. 2022). In an earlier study, Morgan et al (2015) rebukes claims that minority children are overrepresented in special education. The results from his study claimed that minority children are not being identified for a disability that they may have, which results in a lower utilization of intervention services. Therefore, racial and ethnic bias may not explain disparities in access to speech and language services. As a requirement of Individual with Disabilities Education Act (IDEA), schools have an obligation to provide services to students with SPLD, but Morgan et al. (2017) reveals that there are disparities seen based on race, ethnicity, and language use in future studies. This study found that African American children were receiving services for speech or language impairments (SLI) were 61% and 46% lower than odds of white children in 1999 and 2011; Hispanic children were receiving services for SLI were 46% lower than odds of non-Hispanic white children in 2011; and children from a non-English-speaking home received services for SLI were 43% and 50% lower in 1999 and 2011. Furthermore, Pope et al (2022) affirms that African American children receive less speech services as it pertains to augmentative and alternative communication (ACC) intervention because African American children are not given the same privileges as than their White peers. ACC is the use of technological devices such as tablets to help children with SPLD impairments to communicate (ASHA, 2021). Results showed that 63% of White children received 90+ minute per week for AAC compared to 29% African American children. Contrary to these findings, substantial research has shown that racial biases can affected an individual's quality of treatment, so methodological differences in statistical

modeling can explain the discrepancies in whether racial implications affect access to these intervention services.

3.2 Bilingualism. In this study, we will be using Grosjean's definition of bilingualism, which is defined as the use of two or more languages or dialects in everyday life, and it also encompasses multilingualism (Grosjean, 2013). Genessee et al. 2005 defines children who learn another language other than English in the home and then subsequently learn English in school as 'English language Learners' (ELL) or enroll in 'English-Second Language' (ESL) programs to increase their competence in the English language, but Kim and Garcia (2014) states that ELLs are wrongfully placed in special education interventions because educators are not able to recognize the difference between a language difference and a language disability, which could explain why immigrants or culturally linguistic children are being overrepresented. In another study, Han (2012) utilized the Early Childhood Longitudinal Study's Kindergarten Cohort to assess the relationship between bilingualism and academic achievement and discovered that non-English language tended to have lower reading and math scores compared to their English-speaking peers, but this was determined by school-level factors such as the concentration of low-socioeconomic and minority students, teacher's effort, and physical resources. In Spain, Mediavilla et al. (2019) discovered that Catalan-Spanish children with and without a development language disorder (DLD) failed grades more frequently than their peers and were 25% more likely to repeat a grade. Like results seen in other studies, Mediavilla et al. (2019) found that language difficulties have a substantial impact on school-related outcomes, but there has not been much exploration of this phenomenon in the United States.

To conclude, there is substantial evidence supporting that SPLD affects academic performance, but many of these studies are outside the United States. With this, there is little or no systematic research on how the presence of SPLD impacts grade retention outcomes, therefore this study intends to use nationally, representative sample to examine if a similar phenomenon exists across racial and ethnic groups within the US educational system.

Chapter 4: Methods and Procedures

Publicly accessible data was obtained from the National Survey of Children's Health (NSCH), which is a nationally representative survey that examines the health and well-being of US children and adolescents. Children who participated were between the ages of 0 to 17 years of age in all fifty states, including the District of Columbia, and a household representative (parent or guardian) completes a paper or online pre-survey questionnaire via email before he or she receives the remaining questionnaire. If multiple children are present in the household, only one child was selected. Combined datasets from 2016-2017, 2018-2019, 2020-2021 were used (Data Resource Center for Child & Adolescent Health, n.d). After cleaning and filtering NSCH datasets, the total sample obtained was 225,443 study participants.

Eligibility Criteria

Since grade retention is only applicable for children aged 6 and older, children who were less than 5 years of age were excluded. Prior to completing the survey, parents completed consent forms, so additional consent forms were not necessary. Language use will be assessed, so children who speak any language other than English was eligible to participate.

4.1 Variables of Interests

Grade Retention

If a child was retained during the survey year, parents or guardian responded, 'Yes' or 'No' to the following question: 'Since staring kindergarten, has this child repeated any grades?'

Race/Ethnicity

The race/ethnicity of a child was assessed. Parents or guardians were asked, 'What is this child's race/ethnicity?' Changes to this measure were amended after the 2016-2017 survey year. Four

additional racial categories were added: “Asian, non-Hispanic”, “American Indian or Alaska Native, Non-Hispanic”, and “Native Hawaiian and Other Pacific Islander, Non-Hispanic.” Also, “Multi-Race, Non-Hispanic” and “Other Non-Hispanic” split into two categories.

Speech or Language Disorder (SPLD)

Children with and without a speech or language disorder (SPLD) were identified based on parent or guardian response to the following questions: (1) ‘Has a doctor or other health care provider ever told you that this child has a speech or other language disorders?’, (2) ‘Does this CHILD CURRENTLY have any stuttering, stammering, or other speech problems, age 3-17 years?’ For 2016-2017, children who currently had a speech or language disorder were identified if parents responded, “Currently have condition.” For years 2018, 2019,2020, and 2021 the question slightly changed to ‘Does this CHILD currently have speech or other language disorder, age 3-17 years?’ Children who did not have speech disorder if ‘Do not/Does not have condition’ was selected by caretakers across all survey years.

History of Speech Education Services/ Speech Therapy

Speech therapy is defined as a type of early intervention to improve overall speech and language communication with therapeutic activities and techniques. As a result, children who receive speech intervention services may have a decreased risk of repeating a grade, therefore; history of speech will be designated as a predictive measure. Parents or guardians were asked, (1) Is this child currently receiving services under a special education or early intervention plan, age 1-17 years?

Primary Household Language

Monolingualism and bilingualism will also be assessed. Monolingualism was defined as speaking in only one language while bilingualism refers to speaking more than one language. Children were identified as monolingual if their parent or guardian select 'English' and bilingual if 'Other than English' was selected to respond to the following question, 'What is the primary language spoken in the household?'

Federal Poverty Level

The income level of a child's household was assessed. Parents or guardians were asked, 'What is the income level (federal poverty level, FBL) of the household that this child lives in?' The Federal Poverty Levels were designed as (1) "0-99 FPL" (2) "100-199% FPL" (3) "200-399%" (4) "400 FPL or greater"

Parental Education

The educational attainment of an adult in the child's household was assessed. Parents or guardians were asked, 'What is the highest education of adult in this child's household?' The Education Levels were designed as (1) "Less than high school" (2) "High school or GED" (3) "Some college or technical school" (4) "College degree or higher"

4.2 Statistical Analysis

As stated earlier, combined datasets were used. Stratum and weights were applied to improve the accuracy of survey estimates. Since multiple years are being analyzed, survey weights and stratums were applied to define the sampling strata to estimate variance and standard errors for accurate prevalence estimates (U.S Census Bureau, 2022). To calculate the

combined weight of each survey year, study investigators divided the combined dataset by 6. R statistical software, an open-source programming software, was used for statistical analysis. Logistic regression models were used to determine the odds between the following predictors: gender, presence of speech disorder, race/ethnicity, language use, income level, parental education, and history of speech therapy. Grade retention, the dependent variable, was coded to a binary outcome "0" for "YES" or "1" for "NO." Missing cases was coded as "N/A."

Six models were constructed to assess the relationship between the presence of speech and language disorder and grade retention, and the results will be reported with 97.5% CI and p-values. Effect sizes (Cohen's d) will be used in conjunction with odds ratios to quantify the relationship between grade retention and children with speech and language disorders. Since 4% of White children who do not have a speech or language disorder were retained, this will be designated as the "unexposed group," and it will serve as a threshold to assess the odds ratios across all racial and ethnic groups using the following: (Cohen's d = .2 (small) ~ OR = 1.54; .5 (medium) ~ OR = 2.83; .8 (large) ~ 4.95) (Chen et al., 2010).

Tjur R2

Tjur R2 calculates the Coefficient of Discrimination for generalized linear mixed models for binary outcomes (Tjur, 2009)

Chapter 5: Results

5.1 Population Demographics

Overall, 3.6 % of the study population were retained (n=8,008), and 4.7% of the study population currently had a speech or language disorder (n=6,183). 2.7% were “Ever told, but do not currently have the condition” (n=6,183). This means that the child has recovered at some point. A large proportion of the sample population identified as “White, Non-Hispanic” (68.1%). 12.4% of children identified as "Hispanic"; 6.3% identified as “Black, Non-Hispanic”; 4.7% identified as “Multi-Racial”; 4.2% identified as “Other/Multiracial, Non-Hispanic” in the 2016-2017 survey period; 3.6% identified as “Asian, Non-Hispanic.” Smaller portion of the sample population consisted of “American Indian or Alaskan Native, Non-Hispanic”, “Native Hawaiian & Other Pacific Islander, Non-Hispanic”, and “Other Non-Hispanic.” Most parents or guardians in this sample had a college degree or higher (61.7%). The income levels of households were largely “400% Federal Poverty Level (FPL) or greater” or “200%-399% Federal Poverty Level (FPL),” 41.4% and 30.7% respectively. 92.5% of households spoke “English” at home compared 7.0% of household spoke “Other than English.” Refer to Table 4.1 for total demographic data. Also, refer to Table 4.3 for presence of SPLD observed across all racial groups.

5.2 Logistic Regression Models

Presence of SPLD & Grade Retention

In Model 1, presence of a speech or language disorder (SPLD) was the first variable introduced. Children who do have the condition were designated as the reference group. Children with a speech or language disorder had more than 3 times the odds (OR = 3.36, $p < 0.001$, CI [2.91-

3.88]) of being retained compared to children who do not have the condition. Therefore, there is a medium association between the presence of speech and language disorder and grade retention. The change in log odds for children who were “Ever told, but do not currently have the condition” are 0.49 (OR=1.64, p < 0.001, Cl [1.32-2.04]). The odds of children who previously had a speech or language condition have a small, but significant association with being held back. Refer to Table 4.2.

Presence of SPLD, Race, and Gender

In Model 2, race/ethnicity and gender were added. “White, NH” and “Female” were designated as the reference group. American Indian or Alaska Native (OR =2.80, p< 0.001, CI [2.00-3.89] had the highest odds relative to White children, followed by Blacks (OR=1.90, p < 0.001, CI [1.66-2.14] and Hispanics (OR=1.40, p < 0.001, CI [1.21-1.60]. Children who identified as American Indian or Alaskan Native had a moderate, but significant association compared to White children. Children who identified as Black or Hispanic had a small, but significant association compared to White children. Children who identified as Other/Multiracial (OR=1.11, p < 1, CI [0.86-1.43]) had little to no difference compared White children during the 2016-2017 survey year. Similar odds were observed among children who identified as “Multi-Racial, NH” (OR=1.12, p < 1, CI [0.90-1.39] during the 2018-2019 and 2020-2021 survey year. Children who identified as “Other NH” (OR=2.94, p <0.07, CI [0.91-9.51] had a moderate, but significant association compared to White children. Children who identified as “Asian, NH” (OR=0.52, p<0.001, CI [0.39-0.68] and children who identified as Native Hawaiian/Pacific Islander was (OR= 0.93, p < 1, [0.35-2.14] had no difference compared to White Children. Meanwhile, male

children 0.33 (OR=1.39, p < 0.001, CI [1.25-1.54]) had a relatively small, but significant difference of being retained compared to female children. Refer to Table 4.2.

Presence of SPLD, Race, Gender, Federal Poverty Level, and Parental Education

In Model 3, Federal Poverty Level (FPL) and Parental Education were added. "400% FPL or greater" and parents who have a "college degree of higher "were designated as the reference group. Household Income and Parental Education was found to be significant at every level. 0-99% FPL (OR=2.01, p < 0.001, CI [1.72-2.34]) had a small but significant difference compared to 400% FPL or greater. 100-199% FPL (OR=1.51 p<0.001, CI [1.30-1.75]) also had a small but significant differenced compared to 400% FPL or greater. 200-399% FPL (OR=1.24, p<0.001, CI [1.08-1.42]) had a no difference relative to household income with a 400% FPL or greater. For parent education, less than a high school education (OR=2.43, p< 0.001, CI [1.95-3.02]) and high school education or GED i(OR=2.33, p < 0.001, CI [2.04-2.66] had an approximately moderate but significant difference related to parents who have a college degree or higher. Parents with some college or technical school (OR=1.69, p < 0.001, CI [1.50-1.91) had a small, but significant difference relative to relative to parents who have a college degree or higher. Refer to Table 4.2.

Presence of SPLD, Race, Gender, and Language Use

In Model 4, primary household language was added to the model, and it was not found to be a significant predictor in being retained a grade. English was designed as the reference group. Children who spoke a language other than English (OR=1, p <1, CI [0.81-1.24] had no difference relative to children who spoke English in the household. Refer to Table 4.2

Presence of SPLD, Race, and History of Special Education

In Model 5, the history of special education services was added. Children who do not receive special education services were designed as the reference group. The odds for history speech Education were unable to make an accurate prediction due to various services being offered for special education services. Children who were currently receiving special education services (OR=3.82, $p < 0.001$, CI [3.36-4.34] had abnormally large odds ratios relative to children who are not currently receiving special education services. Students who receive special education services have an Individual Educational Plan (IEP), but the National Survey of Children's Health did not specify the specific services that a child receives for a specific condition. Special Education Services covers a wide range of services such as vison and hearing services, speech and language therapy, psychological services, special instruction, and more. Refer to Table 4.2.

Full Model

In Model 6, all the predictors were included. While the odds ratio of the predictors decreased, the statistical relationship remained significant for presence of a SPLD and children who identified as American Indian or Alaska Native, Asian, Black, and Other, NH. The odds ratios for male gender slightly decreased but was still found to be significant. Lastly, social determinants such as household income and parental education were still found to be significant at every level. Refer to Table 4.2.

Chapter 6: Discussion

The objective of this study was to investigate the relationship of grade retention outcomes and the presence of speech and language disorders in the school-aged population. The study revealed that children with speech and language disorders have a greater odds of being retained a grade. Over the years, it has been heavily debated whether grade remediation practices are effective or ineffective way to improve academic outcomes, but study investigators went under the assumption that grade retention is overall detrimental to a child's emotional and social well-being. Our results showed that students who identify as male are at greater odds of being retained a grade compared to students who identify as female. This finding is consistent with the literature as it relates to uncovering the gender differences in grade retention (Owens, 2016). Results also showed that minority children (American Indian or Alaskan Native, Black, Hispanic, Other NH) had an increased odds of being retained compared to White children. Unfortunately, study investigators were unable to uncover the reason as to why these racial and disparities exists, but research has alluded that racism and implicit bias of teachers and school administrators could possibly contribute to these disparities. The influence of the social determinants such as Federal Poverty Level and Parental Education were mediating this relationship. While results showed that language use was not a predictive factor in the likelihood of grade retention, prior research has shown that Early English-Language Learners and children who bilingual/multilingual have difficult academic experiences due to language differences. The National Survey of Children's Health's inquiry about the primary household language was not enough to make a predictive effect in the statistical models.

6.1 Limitations

While this study was able to identify the grade retention outcomes among racial and ethnic children with speech and language disorders, there were some limitations present. First, the "Multi-racial" group was identified differently across survey years, which hinders the year-to-year estimates for this racial group. The severity of speech and language disorder was not considered. For example, children with severe speech and language disorders may have a very different academic experience compared to children with low to moderate speech and language disorders. Additionally, children with language disorders may encounter additional academic challenges because their cognitive ability is impacted while children with speech disorders have motor ability difficulties. Second, this study was not able to fully assess bilingual/multilingual factors in a child. While children who spoke another language than English were identified, this study was not able to capture the specific languages, or the number of languages spoken. Also, the history of speech services could not be assessed appropriately. The NSCH does not specify services that a child receives. For example, a child may receive services for their Autism or learning disability, but not necessarily receive services for their speech. Therefore, this study was unable to determine the predictive nature of being treated with speech therapy. Methodically, study investigators used effects sizes to describe the magnitude of association between groups, but benchmarks proposed by Cohen are general interpretations so meaningful differences could be overlooked. Finally, researchers should be cautious about generalizing these findings. Geographic area was not considered, so grade retention policies and practices may look very different in other states.

6.2 Clinical Implications

Given the importance of special education services, it is imperative that school-based speech language pathologists and teachers collaborate to ensure that students who have speech and language disorders meet the appropriate benchmarks needed to advance to the next grade. Archibald (2017) found that collaborative classroom services improved phonological awareness, vocabulary, and oral language. Therefore, co-teaching may be an effective way to support the students' academic success. Co-teaching is defined as the general education teacher and special education teacher or service provider (e.g., SLP) jointly delivering instruction to students in a general education classroom (Friend, et al. 2010). This collaborative service delivery approach will not only help the child, but it will increase school-based outcomes and inclusivity in the classroom (Zimmerman et al. 2022). Investigators understand that co-teaching may not be a feasible option for speech language pathologists who have large caseloads, but simply inquiring about a student's academic performance could reduce grade retention outcomes amongst this population. Despite the challenges that these children experience, establishing academic goals alongside communication goals with SLP, teacher, and parent can promote academic success.

6.3 Conclusion

Overall, the findings showed that having a speech and language disorder, racial/ethnic minority, being male, and social factors such as income levels and parental education had a significant effect on grade retention. Primary household language was found not to be statistically significant. It is crucial for population surveys to accurately account for language or dialect differences by expounding on the types of language used or the number of languages

spoken in household to gauge bilingualism and multilingualism more accurately. This paper also reveals the importance of parent-reporting of SPLD in identifying children who are at risk for grade retention. Future research should examine the grade retention outcomes of children who were “Ever told, but do not have a speech and language disorder,” so that we can assess the grade retention outcomes between those who “recovered” and those who have not.

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List of Tables

Table 4.1: Population Demographics

Categorical Variables	Sample Percentage (%)	Total Sample (N)
Independent Variables		
Presence of SPLD		
Do not have condition	78.3%	176,505
Children aged 0-2 years	13.9%	31,392
Currently have condition	4.7%	10,539
Ever told, but do not currently have condition	2.7%	6,183
Missing	0.4%	824
Gender		
Male	51.8%	116,672
Female	48.2%	108,771
Race/Ethnicity		
White, NH	68.1%	153,516
American Indian or Alaska Native, NH	0.4%	955
Asian, NH	3.6%	8,108
Black, NH	6.3%	14,315
Hispanic	12.4%	27,855
Multi-Racial, NH	4.7%	10,659
Native Hawaiian & Other Pacific Islander, NH	0.2%	431
Other NH	0.1%	241
Other/Multiracial, NH (2016-2017)	4.2%	9,363
Income Level		
0-99% FPL	11.7%	26,366
100-199% FPL	16.2%	36,540
200-399% FPL	30.7%	69,243
400% FPL or greater	41.4%	93,294
Parental Education		
Less than HS	2.5%	5,541
HS or GED	12.8%	28,931
Some college or technical school	22.4%	50,603
College degree or high	61.7%	139,171
Missing	0.5%	1,197
Household Language		
English	92.5%	208,517
Other than English	7.0%	15,716
Missing	0.5%	1,210
History of Special Education		
Children under 1 year old	3.5%	7,849

Yes	9.2%	20,693
No	86.8%	195,725
Missing	0.5%	1,176
Dependent Variable		
Grade Retention		
Children aged 0-5 years	31.2%	70,265
Yes	3.6%	8,008
No	64.2%	144,725
Missing	1.1%	2,445

*NH denotes “Non-Hispanic.”

Table 4.2: Odds Ratio Estimates from Logistic Regression Analysis

	Model 1			***Model 2***			***Model 3***			***Model 4***			***Model 5***			***Full Model***		
	OR	CI	P-value	OR	CI	P-value	OR	CI	P-value	OR	CI	P-Value	OR	CI	P-value	OR	CI	P-value
Repeated Grade (Outcome)																		
Presence of SPLD																		
Do not have condition (reference)																		
Currently have condition	3.36	[2.91-3.88]	***	3.1	[2.67-3.60]	***	2.98	[2.55-3.47]	***	3.1	[2.68-3.60]	***	1.3	[1.08-1.56]	0.004	1.3044	[1.08-1.57]	0.004
Ever told, but do not currently have condition	1.64	[1.32-2.04]	***	1.61	[1.29-2.00]	***	1.75	[1.39-2.21]	***	1.62	[1.29-2.01]	***	1.16	[0.92-1.46]		1.2814	[1.00-1.64]	0.04
Missing	1.30	[0.83-2.05]		1.19	[0.75-1.89]		1.06	[0.66-1.70]		1.19	[0.76-1.88]		0.93	[0.58-1.50]		0.8386	[0.51-1.37]	
Race/Ethnicity																		
White, NH (reference)																		
American Indian or Alaska Native, NH				2.79	[2.00-3.89]	***	2.08	[1.49-2.91]	***	2.79	[2.00-3.90]	***	2.79	[1.97-3.94]	***	2.1501	[1.52-3.02]	***
Asian, NH				0.52	[0.39-0.68]	***	0.49	[0.37-0.66]	***	0.52	[0.38-0.68]	***	0.57	[0.43-0.75]	***	0.6051	[0.45-0.81]	***
Black, NH				1.9	[1.66-2.14]	***	1.35	[1.19-1.54]	***	1.89	[1.66-2.14]	***	1.84	[1.62-2.08]	***	1.3424	[1.18-1.53]	***
Hispanic				1.4	[1.21-1.60]	***	0.91	[0.79-1.05]		1.38	[1.19-1.60]	***	1.43	[1.24-1.65]	***	1.0449	[0.90-1.22]	
Multi-Racial, NH				1.12	[0.90-1.39]		1.07	[0.85-1.33]		1.11	[0.89-1.40]		1.07	[0.86-1.35]	***	1.0125	[0.80-1.27]	
Native Hawaiian & Other Pacific Islander, NH				0.93	[0.35-2.41]		0.59	[0.22-1.64]		0.93	[0.36-2.41]		0.99	[0.37-2.63]		0.6432	[0.22-1.85]	
Other NH				2.94	[0.91-9.51]	0.07	2.54	[0.83-7.77]		2.85	[0.94-8.71]	0.065	2.76	[1.05-7.26]	0.04	2.3159	[0.97-5.51]	0.057
Other/Multiracial, NH (2016-2017)				1.11	[0.86-1.44]		1	[0.77-1.29]		1.11	[0.86-1.44]		1.14	[0.88-1.48]		1.0549	[0.80-1.38]	
Gender																		
Female (reference)																		
Male				1.39	[1.25-1.55]	***	1.39	[1.25-1.54]	***	1.39	[1.25-1.54]	***	1.28	[1.16-1.43]	***	1.2843	[1.15-1.43]	***
Federal Poverty Level																		
400% or greater (reference)																		
0-99% FPL							2.01	[1.72-2.34]	***							1.9404	[1.66-2.27]	***

100-199% FPL							1.51	[1.30-1.75]	***							1.4819	[1.28-1.72]	***
200-399% FPL							1.24	[1.08-1.42]	0.002							1.2286	[1.07-1.41]	0.003
Parental Education																		
College degree or higher (reference)																		
Less than HS							2.43	[1.95-3.02]	***							2.2852	[2.00-2.61]	***
HS or GED							2.33	[2.04-2.66]	***							2.6412	[2.10-3.33]	***
Some college or technical school							1.69	[1.50-1.91]	***							2.1483	[1.44-1.84]	***
Missing							2.1	[1.29-3.45]	0.003							1.6301	[1.32-3.51]	0.002
Household Language																		
English (reference)																		
Other than English										1	[0.81-1.24]					0.76	[0.60-0.97]	0.02
Missing										1.42	[0.89-2.25]					1.07	[0.78-2.54]	
Received Special Education																		
No (reference)																		
Yes													3.82	[3.36-4.34]	***	3.53	[3.11-4.02]	***
Missing													1.6	[0.87-2.92]		1.4	[0.78-2.54]	
Tjur R^2		0.013			0.017			0.029			0.017			0.038			0.049	

*** p <0.001

Table 4.3: Presence of SPLD by Race**/**Ethnicity

Race/Ethnicity	**Percentage**	**Counts**
White, NH		
Do not have condition	53.26%	12,0068
Children aged 0-2 years	9.54%	21,500
Currently have condition	3.02%	6,809
Ever told, but do not currently have condition	2.07%	4,662
Missing	0.21%	477
American Indian or Alaska Native, NH		
Do not have condition	0.33%	742
Children aged 0-2 years	0.05%	107
Currently have condition	0.03%	68
Ever told, but do not currently have condition	0.02%	34
Missing	0.00%	4
Asian, NH		
Do not have condition	2.94%	6,629
Children aged 0-2 years	0.46%	1,035
Currently have condition	0.13%	298
Ever told, but do not currently have condition	0.05%	108
Missing	0.02%	38
Black, NH		
Do not have condition	5.07%	11,436
Children aged 0-2 years	0.73%	1,635
Currently have condition	0.40%	894
Ever told, but do not currently have condition	0.11%	258
Missing	0.04%	92
Hispanic		
Do not have condition	9.59%	21,616
Children aged 0-2 years	1.75%	3,940
Currently have condition	0.67%	1,515
Ever told, but do not currently have condition	0.29%	648
Missing	0.06%	136
Multi-Racial, NH		
Do not have condition	3.57%	8,040
Children aged 0-2 years	0.77%	1,734
Currently have condition	0.25%	567
Ever told, but do not currently have condition	0.13%	282
Missing	0.02%	36
Native Hawaiian & Other Pacific Islander, NH		
Do not have condition	0.15%	345

Children aged 0-2 years	0.03%	61
Currently have condition	0.01%	16
Ever told, but do not currently have condition	0.00%	6
Missing	0.00%	3
Other NH		
Do not have condition	0.09%	206
Children aged 0-2 years	0.01%	25
Currently have condition	0.00%	5
Ever told, but do not currently have condition	0.00%	5
Other/Multiracial, NH (2016-2017)		
Do not have condition	3.29%	7,423
Children aged 0-2 years	0.60%	1,355
Currently have condition	0.16%	367
Ever told, but do not currently have condition	0.08%	180
Missing	0.02%	38