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How Important are Accommodations? Examining the Retention of Students with Specific Learning Disabilities in Higher Education

by

Donna Stanic

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Submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy
Department of Higher Education, Leadership, Management and Policy
Seton Hall University
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COLLEGE OF EDUCATION & HUMAN SERVICES
DEPARTMENT OF EDUCATION LEADERSHIP MANAGEMENT & POLICY

APPROVAL FOR SUCCESSFUL DEFENSE

Donna Stanic has successfully defended and made the required modifications to the text of the doctoral dissertation for the **Ph.D.** during this **Spring** Semester.

DISSERTATION COMMITTEE

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The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation.

DEDICATION

This dissertation is dedicated to my students, past and present, who continuously show me the true meaning of perseverance.

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Completing this dissertation has truly been a labor of love. However, I would not have been able to make this journey without the support of my committee, family, and loved ones.

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ABSTRACT

Students with disabilities are entering higher education at higher rates than ever before. However, the retention rates of these students are disproportionately low compared to peers without disabilities. More so, students with learning disabilities are less likely to be retained compared to those with other types of disabilities. This study sought to examine the factors that influence first to second year retention of students with disabilities, specifically those with learning disabilities. Among these factors, the study placed a specific focus on the use of accommodations. Utilizing data from the High School Longitudinal Study (HSLS:09), descriptive and inferential analyses were conducted to address the three research questions. Findings indicated that students who identified as having a disability had lower odds of being retained compared to students who did not identify as having a disability. For students with disabilities, there was no significant difference in retention between those who utilized accommodations and those who did not utilize accommodations. For students with learning disabilities, there was a significant and negative association between accommodation use and retention. Other backgrounds and college-level characteristics were also associated with retention for both samples. This study outlines implications for university practice and policy based on those findings. Recommendations for future research are also discussed.

Key Words: Retention, Accommodations, Disability, Specific Learning Disability, Higher Education

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CHAPTER 1

INTRODUCTION

Within the United States, the number of students with disabilities entering higher education is greater than ever before. According to data from the National Center for Education Statistics (2018), as of the 2015-2016 school year, approximately 19% of undergraduate students nationwide reported having a disability. This number represents an increase from the 2007-2008 school year, when approximately 11% of all students enrolled indicated having a disability (Snyder et al., 2016). Furthermore, specific learning disabilities are the most commonly reported disabilities across all institutions of higher education, with numbers increasing year over year (Raue & Lewis, 2011; Troiano et al., 2010). Of all higher education students with disabilities, 61% reported having a specific learning disability as of 2011(Newman et al., 2011).

The increasing rate of students with disabilities entering postsecondary institutions can be attributed largely to changes in federal policies. Starting in the 1960s with the Civil Rights movement, individuals with disabilities were granted more rights and federal protections. Previously, individuals with disabilities could be denied equal access and treatment in secondary and higher education settings. In 1965, the nation's primary education law, the Elementary and Secondary Education Act (ESEA), ensuring equal educational opportunities to all students, was enacted. This law, later reauthorized as the No Child Left Behind Act (NCLB) (2002) and more recently as the Every Student Succeeds Act (ESSA) (2015), established safeguards to help to ensure greater accountability, develop effective educators, and increase access to evidence-based instructional practices for students, especially those with disabilities (U.S. Department of Education, n.d.).

By 1975, Congress had also passed the Individuals with Disabilities Education Act (IDEA), which was amended in 2004 and again by the ESSA. IDEA is the prime piece of special educational legislation that guarantees students with disabilities, ages 3-21, the same educational opportunities as those without disabilities (Leake & Stodden, 2014).

Another legislation that emerged at this time was Section 504 of the Rehabilitation Act of 1973, which prohibited discrimination against individuals with disabilities by educational institutions receiving federal funding. The Americans with Disabilities Act (ADA) of 1990 expanded this law to include all institutions of higher education, regardless of federal funding. In addition to prohibiting discriminatory practices, ADA also requires that institutions of higher education provide "reasonable accommodations" to students who meet eligibility criteria for a disability (DaDeppo, 2009; Mamiseishvili & Koch, 2011). More recently, the Higher Education Opportunity Act (HEOA) of 2008 added to the provisions of the Higher Education Act (HEA) of 1965. HEOA ensures the identification and implementation of transition practices, the accessibility of instructional materials, and the dissemination of best practices to increase access, retention, and degree completion rates of disabled students (Council for Exceptional Students, 2008).

Although additional legislation has been implemented to protect the rights of students with disabilities and prevent discriminatory practices, this population continues to lag comparable to peers in terms of educational outcomes, including retention in higher education (Aron & Loprest, 2012).

Problem Statement

While individuals with disabilities are entering higher education at historically higher rates, the rate of retention from first to second year at the same institution and graduation rates or

earning a degree or certificate remains low for these individuals compared to peers without disabilities. As of 2014, 72% of non-disabled, first-time postsecondary students starting at a two- or four-year institution during the 2011-2012 school year had attained a degree or were still enrolled. This number dropped to 55% for students with disabilities (Snyder et al., 2016). When considering all students with disabilities, those with specific learning disabilities are less likely to be retained compared to those with other types of disabilities (Matesic, 2020). Therefore, this particular group of students warrants further investigation.

Despite the growing number of students with disabilities entering higher education, empirical research surrounding this population remains scarce. Among higher education journals, only about one percent of articles focus on students with disabilities (Peña, 2014). Existing research is mainly qualitative, focusing on student perceptions and experiences (Timmerman & Mulvihill, 2015; Flink & Leonard, 2019). Quantitative research utilizing large, nationally representative samples is limited.

Research that focuses specifically on retention rates of students with disabilities is also lacking (Herbert et al., 2014). Additionally, few studies exist that focus on the retention of students with specific learning disabilities rather than the general population of students with disabilities. Most existing studies also tend to focus on disabled versus non-disabled students in a binary fashion, not differentiating between students with different types of disabilities (Abreu et al., 2017; Kranke et al., 2013). While such research provides valuable insight into the outcomes of students with disabilities, it fails to account for the vastly different impacts, needs and experiences of individuals with different disabilities. Therefore, to deeply understand outcomes such as retention for students with specific learning disabilities, it is critical to focus on this group apart from all other students with disabilities.

Accommodations are adjustments that are needed to allow the individual to participate in a program or activity to the same extent as an individual without a disability. The provision and use of accommodations are viewed as essential components of success for students who choose to self-disclose a disability at the higher education level (Dong & Lucas, 2016). However, the impact of accommodation use on student retention has not been extensively studied. The existing research has many limitations, such as a small sample size and lack of clearly justifiable analysis beyond anecdotal reports.

Although there have been increased efforts to provide appropriate educational opportunities and transition services into adulthood for students with disabilities, these students continue to fall behind their non-disabled peers in terms of educational achievements and tend to fare poorer later in life (Aron & Loprest, 2012). Specifically, students with disabilities are less likely to receive a high school diploma or complete postsecondary schooling. Such outcomes are associated with greater levels of unemployment and criminal records and lower levels of independent living, all of which can be used to determine quality of life (Graf et al., 2004).

Therefore, it is essential to examine retention and graduation rates in higher education, as these factors have been cited as predictors of individuals' quality of life and measures of social equity (Graf et al., 2004). First to second year retention is especially important, as students who successfully complete their first year in college are more likely to return and ultimately graduate (Horn & Carroll, 1998).

Research indicates that retention and graduation are essential for future employment and earnings; college graduates earn significantly more than non-graduates (Leppel, 2002). For instance, according to the National Center for Educational Statistics (2016), compared to individuals with only a high school diploma or equivalent degree, those with a college degree

have significantly higher employment rates. In addition to employment rates, individuals with a college degree have higher average hourly wages. This difference is evident in the general population as well as in the disabled population. For instance, a 2011 study found that individuals with disabilities who had earned a college degree earned on average $12.50 per hour, compared to $9.80 per hour for those who did not have a degree or only had some postsecondary education (Newman et al., 2011).

In addition to these individual benefits, retention in higher education and graduation rates are also beneficial to society in general. As individuals are retained and graduate college, there is less demand on public assistance programs and the criminal justice system (Graf et al., 2004). There is also increased tax revenue and civic participation. Improvements in lifestyle choices, parenting skills, health outcomes, and entrepreneurial activity are also seen in societies comprised of more individuals with college degrees (Watts, 2001).

Given the individual and societal importance of retention and eventual degree completion, it is critical to further examine why students with disabilities, especially those with specific learning disabilities, are not retained at a comparable rate as those without disabilities. Such findings can help to support institutions and students in increasing retention rates, which in turn may place less burden on programs required for public assistance. Retention rates are also important to examine at the institutional level, as they typically correspond to measures of academic quality and student success (Lichiello, 2012).

Purpose Statement

The purpose of this study is to examine the factors that predict first year retention of students with disabilities at four-year public and private institutions of higher education in the United States. A specific focus will be placed on students who self-identify as having specific

learning disabilities, such as dyslexia, dysgraphia, or math disabilities, as these students are less likely to be retained than students identifying within any other disability group (Matesic, 2020). Additional attention will be placed on the influence of accommodation use and the retention of these students. Specifically, whether or not a student received an accommodation or service at a postsecondary institution to help support a disability need, such as early registration, testing support or counseling, will be considered when examining retention. In addressing these issues, this study will add to the limited quantitative research available on the retention of students with disabilities and the impact of accommodation use in higher education. The findings of this study can also be utilized to inform university policy surrounding best practices in serving students with disabilities in higher education.

Significance of Study

This study is significant to the research on student disabilities in higher education, as it closely examines the outcomes of students with specific learning disabilities, who comprise 61% of all students with disabilities in higher education (Newman et al., 2011). Across all institution types, specific learning disabilities are the most commonly reported types of disabilities (Raue & Lewis, 2011). However, there is limited research that focuses on students within this specific group. When considering the large number of students with specific learning disabilities entering higher education, it is important to examine their experiences and outcomes, such as retention, more closely. Additional research in this field will help to guide policy and practice to increase retention and improve student outcomes, such as employment, earnings, and independent living (Aron & Loprest, 2012). Therefore, it is critical to examine retention factors for this group, apart from students with disabilities as a whole.

Additionally, of all the factors impacting the retention of students with disabilities in higher education, the use of accommodations is the least researched and understood (Kutscher & Tuckwiller, 2018). Compared to 94% of students who received accommodations in high school, only 17% of students with learning disabilities received accommodations and services in higher education (Cortiella & Horowitz, 2014). Therefore, this study will seek to shed light on the influence of accommodation use on the retention of students with disabilities and, more specifically, on the retention of those with learning disabilities.

Research Questions

This study seeks to answer the following research questions:

1. Is the existence of any disability related to first-year retention?
2. Controlling for other factors, are students with disabilities who utilize accommodations retained at a higher rate than those who do not utilize accommodations?
3. Among students with specific learning disabilities, are those who utilize accommodations retained at a higher rate than those who do not utilize accommodations, controlling for other factors?

Brief Review of Theoretical Framework

Several theoretical models have been developed to better understand the factors predicting student persistence and departure from higher education. One of the most widely cited theoretical models is Tinto's (1975) model of voluntary student departure. Through this model, Tinto proposes that student persistence results from a longitudinal interaction between individual student characteristics and the academic and social characteristics of the institution. Tinto further theorizes that students arrive at college with certain background characteristics, including gender, age, race/ethnicity, socioeconomic status, and high school experience. These

individual characteristics affect academic goals and institutional commitments, which are continuously modified through the students' academic and social interactions with the college community. The individual background characteristics, as well as academic and social integration factors proposed by Tinto, will be utilized as a framework for this study.

Additionally, according to Tinto's model, background characteristics, such as minority status, negatively impact student retention. As the existence of a disability may be considered a minority status, leading to biases, stigmatizing attitudes, and poorer outcomes (Kim & Lee, 2016), it is important to further refine Tinto's model. Therefore, the Disability-Diversity (Dis) Connect Model (DDDM) will be utilized to expand upon Tinto's theoretical framework to include disability as another potential background characteristic. The DDDM is a more recently developed conceptual framework, which seeks to establish disability as a minority status and, therefore, as another aspect of diversity (Aquino, 2016). This model is based on the idea of acceptance, inclusion, and integration into the academic and social setting in higher education, which have already been established as important predictors of retention in Tinto's (1975) model. The DDDM will be utilized to further expand on how inclusion and belonging may impact disability disclosure, accommodation use, and, therefore, retention. These two models will be incorporated to create a new conceptual model to test the research questions.

This study will employ data from the National Center for Education Statistics' High School Longitudinal Study (HSLS:2009), which included various phases of data collection from 2009 through 2018. This quantitative study will utilize descriptive statistics to describe the samples as well as binary logistic regression analyses to address the research questions.

Organization of Dissertation

This study will be organized into five chapters. Chapter One introduced research and policy issues surrounding students with disabilities in higher education. It outlined the purpose and significance of this study as well as the research questions. Chapter One also provided a brief outline of the theoretical framework that will be the basis for this study. Chapter Two begins with a review of relevant terminology and a historical background. It also provides a thorough review of existing literature regarding students with disabilities in higher education, including the factors that influence retention among the general population as well as for those with disabilities. Chapter Two also proposes the conceptual model that is used for the purpose of this study, based upon the factors outlined in the literature review. Chapter Three reviews the methodology of this study, including the data source and samples. The quantitative research design is also reviewed. Chapter Four reviews the findings of the data analysis as they relate to the research questions. Finally, based upon these findings, Chapter Five draws conclusions and reviews implications for policy and future research.

CHAPTER II

LITERATURE REVIEW

This literature review will first define relevant terminology within the literature, provide a brief historical background regarding the legislation surrounding individuals with disabilities, and review relevant theoretical models. Factors predicting the retention of students in higher education will be reviewed, both for the general population and for students with disabilities. A conceptual model that outlines the relationship among these various factors and the outcome of retention will also be proposed. The literature review will conclude with a discussion of the limitations and gaps in current literature.

Terminology

To understand the factors that impact retention of students with disabilities in higher education better, it is important to clearly define a few terms: "retention," "disability," and "specific learning disability." Formulating a clear definition of "retention" is a difficult task, as there are inconsistencies in the literature and among institutions of higher education (Renn & Reason, 2013). For instance, "retention" is often used interchangeably with other terms such as "persistence" and "educational attainment" when, in practice, these terms are often used to describe different outcomes. For the purpose of this review, I will utilize the National Center of Education Statistics' specification of "retention" as an institutional measure or organizational phenomena (Hagedorn, 2006; Renn & Reason, 2013). "Retention" will be defined as a first-time, full-time, degree-seeking student at a four-year institution continuing enrollment from their first to their second year at the same institution of higher education in which they originally enrolled (National Center for Education Statistics, 2020).

While “retention” examines continuous enrollment at a single institution of higher education, “persistence” more broadly examines continuous enrollment at any institution of higher education (National Center for Education Statistics, 2017). However, consistent with past research, I will use both “retention” and “persistence” within this literature review to accurately convey the original message and findings of the authors, as differentiation between these terms does not always exist in the literature.

An individual with a “disability” has been legally defined under the Americans with Disabilities Act of 1990 (ADA) as someone with “a physical or mental impairment that substantially limits one or more major life activities, has a record of such an impairment, or is regarded as having such an impairment” (United States Department of Justice, 2010, p. 30). Major life activities specifically defined under Section 504 of the Rehabilitation Act of 1973 include “caring for one’s self, walking, seeing, hearing, speaking, breathing, working, performing manual tasks, and learning” (United States Department of Health and Human Services, n.d. p. 1). It is therefore important to emphasize that disabilities are not limited to visible, physical conditions but also encompass sometimes invisible, cognitive, or psychological difficulties, such as anxiety, depression, or learning difficulties.

This study will focus on one group of disabilities—specific learning disabilities. According to the Individuals with Disabilities Education Act (IDEA) (2004), a “specific learning disability*”* is defined as:

> a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including

> conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. (para. c.10)

This federal definition of "specific learning disability" explicitly excludes problems with learning that are "primarily the result of visual, hearing, or motor disabilities, of intellectual disability, of emotional disturbance, or of environmental, cultural, or economic disadvantage" (IDEA, 2004, para. c.10). Therefore, for the purpose of this review, learning difficulties that are the result of other physical, cognitive, or psychological impairments or environmental factors, such as blindness or lack of educational access, will be excluded from this definition.

While there is a federal definition of "specific learning disability," it is important to note that these disabilities are largely ambiguous and amorphous. Guidelines regarding the identification of students with specific learning disabilities vary by state and district. The lack of an operational definition of "specific learning disability" may lead to inconsistencies in disability identification (Cottrell & Barrett, 2016).

Aside from operationally defining the main factors relating to this review, it is also important to outline the historical background of education for students with disabilities. This will help to lay the groundwork and context for the current state of students with disabilities in higher education.

Historical Background

The increasing rate of students with disabilities entering higher education can be largely attributed to changes in legislation protecting the rights of individuals with disabilities. Before the 1960s, individuals with disabilities could be denied equal access and treatment in elementary, secondary, and higher education settings. Those with disabilities faced major educational barriers and could be excluded from attending a school solely on the basis of their disability (Paul, 2000).

Starting with the Civil Rights movement, individuals with disabilities began calling for greater protections and entitlements under the law. Though the Civil Rights Act of 1964 did not explicitly provide equal protections for those with disabilities, as it did for other marginalized groups, it did start a catalyst for legal reforms in education (Middleton et al., 2011). In addition to providing for greater supports and opportunities for students, these laws also helped to reduce discriminatory practices, leading to greater numbers of students with disabilities being prepared for and comfortable with entering higher education.

Legislation

Currently, there are five major laws concerning the educational rights of individuals with disabilities: Section 504 of the Rehabilitation Act of 1973, the Individuals with Disabilities Education Act (IDEA), the Americans with Disabilities Act (ADA), the Every Student Succeeds Act (ESSA), and the Higher Education Opportunity Act (HEOA).

Rehabilitation Act of 1973 – Section 504. Section 504 of the Rehabilitation Act of 1973 was the first major victory in the fight for equality for individuals with disabilities. This law prohibited excluding, denying benefits to, or discriminating against individuals with disabilities in any type of federally financed program or activity (U.S. Department of Labor, n.d.). Included in this definition are colleges, universities, postsecondary institutions, and public systems of higher education, which are subject to these mandates, as they typically receive federal funds through student financial aid programs. While this law was a vital step in ensuring equal access to higher education for students with disabilities, several issues were left unaddressed.

For instance, this law did not outline in any specific terms which types of conditions were included or excluded from the definition of "disability." While some conditions, such as blindness or orthopedic impairments, clearly fell under the purview of the law, other conditions,

such as crossed eyes or weak muscles, were less clearly protected. Therefore, the question of who was considered disabled under the law was left unclear.

While individuals with specific learning disabilities are generally protected under Section 504 mandates, some areas of uncertainty and disagreement exist (Rothstein, 1986). For instance, questions arise regarding the timeline of determining a specific learning disability and providing reasonable accommodations. Students who arrive at college with a well-documented disability cannot be discriminated against and are entitled to accommodations. What is less clear is if students do not disclose their disability or do not have formal diagnoses. This factor is especially relevant for specific learning disabilities, as they are more likely to be uncovered later in life, such as during postsecondary education, compared to other types of disabilities, which may be more easily visible and identifiable (Rothstein, 1986).

Additionally, what exactly constitutes a reasonable accommodation has been debated, though this is generally regarded as any adjustment that is needed to allow an individual to participate in a program or activity to the same extent as an individual without a disability. While it is not the responsibility of the institution to uncover a disability, negative outcomes such as lower grade point average (GPA) and higher dropout rates may exist for students entering higher education with undisclosed disabilities or lack of accommodations.

Individuals with Disabilities Education Act (IDEA). By the 1970s, Congress had passed the Individuals with Disabilities Education Act (IIDEA), later reauthorized as the Individuals with Disabilities Education Improvement Act (IDEIA) in 2004. IDEA is the prime piece of special education legislation that guarantees students with disabilities the same educational opportunities as those without disabilities (Leake & Stodden, 2014). The most central components of IDEA are the assurance of a free and appropriate public education (FAPE)

within the least restrictive environment (LRE) to all students, regardless of disability status (IDEA, 2004). IDEA applies to students ages 3 through 21 or until high school graduation, whichever comes first. While this law applies predominantly to students in elementary and secondary education, it is also relevant to higher education, as it often lays the framework for the expectation of accommodations at the postsecondary level.

Specifically, IDEA required that students with disabilities be involved in transition planning from secondary to postsecondary education (DaDeppo, 2009). Transition planning is the process by which secondary schools facilitate a student's move to a postsecondary setting. This process must begin no later than age 16 and involves working with the student to identify their postsecondary goals based upon their strengths, interests, and preferences. These goals must be measurable, and coursework must align closely with the goals (Trainor et al., 2015). In addition, the transition plan must outline the supports necessary to move towards these goals. Research has indicated that participation in transition planning and the inclusion of postsecondary accommodations needed after high school in a transition plan increase the likelihood of a student disclosing their disability to a higher education institution and receiving both general and disability-specific accommodations, both of which have been associated with higher retention rates (Newman et al., 2016).

Americans with Disabilities Act (ADA). The Americans with Disabilities Act (ADA) of 1990 expanded on these existing laws to include all institutions of higher education, regardless of federal funding. In addition to prohibiting discriminatory practices, ADA also required that institutions of higher education provide reasonable accommodations to students who meet eligibility criteria for a disability (DaDeppo, 2009; Mamiseishvili & Koch, 2011). Under ADA, students must inform the institution of their disability, provide appropriate documentation of a

disability, such as a medical notice or report from a diagnostician, and request specific accommodations. Institutions are not required to provide accommodations if the student has not informed them of a disability or requested accommodations (Kaplin et al., 2019).

Though institutions are required to accommodate students based on their disability, they are not required to alter their academic criteria or program requirements to meet the needs of the student (Kaplin et al., 2019). Therefore, it is critical for institutions to closely examine requests for accommodations on an individual basis to determine which supports are needed to provide equal access and inclusion in an educational setting to individuals with disabilities when compared to peers without a disability. This evaluation is done to protect the student from not being discriminated against on the basis of a disability but also for the protection of the institution so it can demonstrate that it has considered accommodations and alternative means to educate the student without lowering academic standards or alterations to programs.

Every Student Succeeds Act (ESSA). In 2015, Congress passed into law the Every Student Succeeds Act (ESSA), which reauthorized the Elementary and Secondary Education Act (ESEA), the predecessor to the No Child Left Behind (NCLB) Act. The goal of ESSA is to close educational achievement gaps by ensuring that all children have an opportunity to receive a fair, equitable, and high-quality education (National Council on Disability, 2018). This goal is accomplished primarily through the requirement of states to establish systems for educational standards, assessments, and accountability.

ESSA outlines specific requirements for educating students with disabilities by ensuring that these students are afforded the individualized educational services to support them in being involved in the general education population and making progress in the general education curriculum to the maximum extent possible (National Council on Disability, 2018). While states

are permitted to develop alternate academic achievement standards (AAS) for students with the most severe disabilities, these AAS must align to the state's academic content standards and ensure that students with disabilities are able to pursue postsecondary education or integrated employment upon high school graduation (ESSA, 2015).

Higher Education Opportunity Act (HEOA). Additionally, the Higher Education Opportunity Act (HEOA) of 2008 exists, which adds to the provisions of the Higher Education Act (HEA) of 1965. The HEOA ensures the identification and implementation of transition practices, the accessibility of instructional materials, and the dissemination of best practices to increase access, retention, and degree completion rates of students with intellectual disabilities (Council for Exceptional Students, 2008). For the first time, under the HEOA, students with intellectual disabilities could be eligible for federal work-study programs, Pell grants, or supplemental educational opportunity grants under the HEOA (Lee, 2009).

Under the HEOA, funding was also designated for programs and projects focused on developing training opportunities for educators in methods and strategies specifically designed to work with students with disabilities (Madaus et al., 2012). This law is progressive in not only ensuring equal access to education for students with disabilities but also by making advances in providing financial support to students to assist with the cost of higher education and to institutions to provide advanced training to specifically support students with disabilities.

Differences in Legal Requirements Between K-12 and Higher Education

Though there are some legal mandates that protect the rights of individuals with disabilities across the lifespan, such as Section 504 of the Rehabilitation Act and the ADA, some differences exist between K-12 and higher education in terms of protections and responsibilities for students with disabilities. For instance, under IDEA, it is the responsibility of the school

district to identify and evaluate all students suspected of having a disability at no cost to the family. If a student is found to have a disability, it is then the responsibility of the school district to develop an Individualized Education Plan (IEP), which outlines the disabling condition, special education program, and necessary accommodations and modifications (IDEA, 2004). At this level, the identification of a disability and provision of accommodations are the responsibility of the school district.

On the other hand, at the higher education level, students must self-disclose their disability and provide documentation of the disability to the college. Students are also responsible for requesting their own accommodations, such as extended time for testing, notetakers for class, or counseling. The responsibility of the school lies only in protecting the student from discrimination based on their disability, typically by reviewing these student requests and providing reasonable accommodations (Middleton et al., 2011). Much of the burden of protecting students with disabilities from discrimination and providing them with accommodations shifts from school to student at the higher education level. Unfortunately, for many students with disabilities, some of the greatest challenges lie in their difficulties with autonomy and self-determination, making self-disclosure and requests for assistance difficult (Getzel, 2008).

Theoretical Framework

To better understand the factors that impact the retention of students with disabilities, it is important to examine the theoretical framework that has already been established in the literature. As no comprehensive model of retention currently exists for students with disabilities, it is necessary to merge two existing models. The two models to be utilized include Tinto's (1975) Model of Voluntary Student Departure and the Disability-Diversity (Dis) Connect Model

(Aquino, 2016). A conceptual model will be proposed based on the integration of these existing theories and will focus on retention factors in the general student population, such as background characteristics, as well as factors which have also been examined specifically for students with disabilities, such as academic and social integration, disability disclosure, and accommodation use.

Tinto's Model of Voluntary Student Departure

One of the most widely cited and influential models of student retention is Tinto's Model of Voluntary Student Departure or Institutional Departure Model. This model, originally proposed by Tinto in 1975, has been refined over the years. The Model of Voluntary Student Departure, which was originally framed in terms of student dropout behaviors, can be reframed to understand retention behaviors, as dropout and retention can broadly be evaluated on opposite ends of a single spectrum. Though Tinto utilized the term "persistence" frequently throughout his works, his model is relevant to this research as it is one which explains student departure in terms of dropout from a particular institution and not from the system of higher education, which is more aligned to my operational definition of retention.

Essentially, Tinto's model suggests that students arrive at college with a set of individual characteristics, family backgrounds, and educational experiences, which influences their goal of persistence in higher education, as well as their commitment to an institution. Individual characteristics are those attributes that are specific to the person in question. Specifically, Tinto cited differences in persistence between males and females, with males being more likely to persist. Tinto also noted that there are personality characteristics that may predict dropout behavior, with students who drop out being more impulsive, anxious, restless, and sensitive.

When discussing family backgrounds, Tinto (1975) outlined how socioeconomic status is related to persistence, with students of higher socioeconomic status having higher rates of persistence. Tinto also incorporated parents' education into his model, arguing that students whose parents have higher levels of education are more likely to persist. Finally, Tinto explored the importance of the parent-child relationships, outlining how a parent's relationship with their child, including their interest in and expectations regarding their child's education, is a predictor of persistence in higher education.

In terms of educational experiences, Tinto explained that past educational performance, as measured by high school GPA or class rank, relates to higher education persistence. High school characteristics, such as adequate facilities and quality academic staff, are also important predictors of persistence in higher education, as they help to shape a student's educational expectations and motivations.

Integral to this model are the interactions between the student and the institution, which occur through a longitudinal progression. In expanding on the impact of these interactions on retention, Tinto proposed the importance of specific experiences in higher education, including academic and social integration. Academic integration refers to the degree of interaction and satisfaction with the academic system, such as with faculty and staff engagement, as well as perceived intellectual development and growth because of these interactions. Social integration refers to the degree of interaction and satisfaction with the social system, such as with peer engagement and extracurricular activities. Social integration is impacted by perceptions of inclusion and belonging within a community (DaDeppo, 2009; McGregor et al., 2016; Tinto, 1975).

Based on these background characteristics, goals, and institutional commitments, students have differing interactions within their college environments. These interactions may lead to modifications in goals and institutional commitments. If these factors remain stable, the student has a higher likelihood of retention; however, if goals and institutional commitments are altered, the student has a higher likelihood of dropping out. By 1993, Tinto added external commitments, such as family and work obligations, to his model and explained how these factors may impact initial developments and modifications of goals and institutional commitment (Aljohani, 2016; Tinto, 1993). Again, in 1997, Tinto added to his model institutional experiences, such as classes, labs, and studios, as well as student factors such as quality of student efforts in learning and intentions (Tinto, 1997). Up until 2010, Tinto continued to incorporate new factors into his model, such as institutional characteristics and classroom practices, such as student portfolios and cooperative learning (Tinto, 2010).

Although this model provides an empirically sound and comprehensive framework for understanding student persistence, there are several limitations. For instance, even the revised version of this model is now outdated and leaves room for continued exploration. For example, completion rates for different populations originally outlined by Tinto have changed over time. Since 1996, women's attainment of higher education degrees has outpaced men's (U.S. Census Bureau, 2016a). Additionally, Tinto's model has been criticized for being applicable only to traditional types of students: those who enter college immediately following high school and who have a typical campus life experience (McCubbin, 2003). Some researchers have found this model to be inappropriate to use with underrepresented, minority groups due to limitations with the measurement of social integration (Braxton et al., 2004; French; 2017; Merriweather Hunn, 2008). Hurtado and Carter (1997) also noted that for diverse student populations, a sense of

belonging within the higher education landscape could not be as easily understood and addressed by Tinto's model alone. Therefore, to improve on Tinto's model and to explore the factors impacting the retention of students with disabilities, which constitutes a minority status (Newman et al., 2020), it is important to incorporate a model designed to address the specific experiences of this diverse group.

Disability-Diversity (Dis) Connect Model

Within the higher education landscape, issues surrounding minority status and diversity have often focused on characteristics such as race and ethnicity. Though not typically included in research surrounding diverse groups, individuals with disabilities may endure similar types of marginalization and stigmatization as those of racial or ethnic minority status (Herrick, 2011). Regardless, rather than incorporating disability as a diversity characteristic, it has often been haphazardly incorporated into research or theoretical models as an afterthought (Gilson et al., 2002). There remains a misconception in the higher education literature that disability status is a less important or less valuable component of a student's overall diversity identity (Darling, 2013; Davis, 2011; Erevelles & Minear, 2010; Stanley et al., 2013).

In addition to not being given equal weight within the diversity literature, disability continues to be examined under the medical model as an impairment, deficiency, or obstacle that must be fixed or overcome rather than a student characteristic (Aquino, 2016b; Artiles, 2013). In a qualitative study that sought to examine opinions regarding the inclusion of students with learning disabilities in multicultural content, May and LaMont (2014) found that faculty perceived learning disabilities as a negative student characteristic and deficit rather than an accepted part of the student's identity. More recently, Hansen and Dawson (2019) continued to find considerable misconceptions among all levels of educators, administrators, and the public

about disabilities, such as fallacies that these students are less intelligent or willing to work. As a result, students with disabilities often felt unwelcomed in college. If these students do not feel accepted and supported, they may not be satisfied with their experience or be able to experience full inclusion, which in turn impacts retention (Wilson et al., 2000).

The Disability-Diversity (Dis) Connect Model (DDDM) is a more recent conceptual framework that seeks to establish disability as an aspect of diversity. The essence of the DDDM is rooted in equal acceptance and inclusion in college as a diverse academic setting (Aquino, 2016). As inclusion—the integration of individuals with disabilities into social and academic higher education settings—has already been established as an important predictor of retention, it is important to better understand the factors and barriers which may impact the integration of students with disabilities in higher education (Hoffman et al., 2019). Aquino (2016) noted that there are limitations within the higher education landscape regarding student disability due to minimal awareness of or exposure to disability. This type of environment can then perpetuate a cycle of misunderstanding, exclusion, and stigmatization.

Therefore, the reconceptualization of disability as a diversity characteristic rather than an impairment may help to reduce the stigmatization of disability and lead to greater inclusion in the higher education setting. If students perceive disability as an accepted component of student diversity, they may be more likely to disclose their disability and request accommodations, which can result in greater integration within their institutional setting (Aquino, 2016). The understanding of disability as a diversity characteristic may also help students acknowledge stigmatization and develop greater levels of resiliency, which in turn would increase social and academic integration. This model, therefore, restructures the cyclical pattern in a more positive light. As summarized by Newman et al. (2020),

> The existence of a disability can lead to stigmatizing attitudes and biases, and being assigned to a minority status that can negatively impact belonging in college and persistence; however, positive encounters with formal and informal academic systems within an institution may lead to greater integration, and in turn, to persistence. (p. 2)

Therefore, it is important to incorporate the DDDM with the Model of Voluntary Student Departure to arrive at a more comprehensive framework of the factors that impact the retention of students with disabilities in higher education. Specifically, the DDDM helps to explain how feelings of acceptance may help to reduce stigmatization regarding disability, as it is seen as an element of diversity rather than an impairment. Reductions in discrimination and stigmatization, as well as greater integration, may also lead to greater self-help behaviors, such as disclosing a disability and requesting accommodations, which in turn may improve both social and academic integration.

Retention Factors for General Higher Education Population

This literature review will outline specific factors that have been found to predict retention rates in the general higher education population, with a specific focus placed on factors that also predict retention for students with disabilities. Within the research, these factors typically fall into four main categories: background characteristics, college-level characteristics, academic and social integration, and disability disclosure and accommodation use.

Background Characteristics

Students arrive at college with a certain set of background characteristics and experiences. Tinto (1975) describes these factors as the individual characteristics, family backgrounds, and educational experiences that shape a student's goals and institutional commitments. In reviewing the literature on student retention, it is important to adequately

consider the background characteristics that may influence a student's decision or ability to be retained at a postsecondary institution. Based on existing literature, sex, race/ethnicity, and socioeconomic status (SES) will be considered as background characteristics, as they have been shown to have some relationship with student retention. Other background characteristics, such as age, first-generation status, SAT/ACT scores, high school GPA, individual resiliency/motivation, and disability type and disclosure, will be explored briefly as factors relating to student retention. However, due to the limitations of this study or redundancies with other factors, they will not be included in the conceptual model.

Sex. Existing research on the effects of sex on student retention in the general population has been mixed and inconclusive (Reason, 2003). Whereas some researchers have found that women have a higher probability of retention (Astin & Oseguera, 2005; Dickson, 2011), others have found similar results for men (DeNicco et al., 2015; Leppel, 2002). Additionally, some research has suggested that sex on its own has minimal predictive value on retention. For instance, a study by St. John et al. (2001) found that males were more likely to be retained when holding constant background variables and SAT scores; however, this finding was no longer significant when institutional characteristics were also considered. Research has also suggested that the interaction between sex and race tends to have a more predictive nature on retention than sex alone. For instance, Leppel (2002) found that being Black increased the likelihood of persistence only for females when compared to males.

Research regarding the influence of sex on the retention of students with disabilities has been slightly more conclusive in recent years. Utilizing logistic regression analysis, Mamiseishvili and Koch (2011) found that among students with disabilities, being female was a significant predictor of first to second year retention. Pingry O'Neill et al. (2012) also found that

among students with disabilities, the odds of female students graduating were 1.5 times higher than for males with comparable characteristics and disability support services. This difference may be explained by females in this study being more likely to report and be medicated for a disability, thus benefitting more greatly from the medication and/or the support services available to those who self-disclose to the university. Lastly, when examining factors related to non-retention from first to second year for students with disabilities, Koch et al. (2018) found that being a male increased the likelihood of not being retained.

Race/Ethnicity. Race and ethnicity have been well documented in the literature as factors related to student retention (DeNicco et al., 2015; McClain & Perry, 2017; Peltier et al., 1999; Reason, 2003). Research shows somewhat consistently that students belonging to minority groups are more likely to drop out and not obtain their college degrees despite higher education institutions making attempts to retain them (McClain & Perry, 2017). Within this context, it is important to note that Asian Americans are more likely to be retained than other minority groups and are therefore not always considered minorities when discussing retention (Reason, 2003). For instance, the National Center for Education Statistics (2019) recently found that the 6-year completion rates at a 4-year college were highest for Asian students (74%), followed by White/Caucasian students (64%), and students reporting two or more races (60%). These rates dropped for Hispanic students (54%), Pacific Islanders (51%), Blacks (40%), and American Indians/Alaska Natives (39%) (National Center for Education Statistics, 2019).

When examining the factors which impacted first year persistence at a large 4-year public research institution, Stewart et al. (2015) found that Asian/Pacific Islander students were most likely to persist, followed by African American/non-Hispanic students, White/non-Hispanic students, Hispanic students, and American Indians/Alaska Natives. While this study is consistent

with the finding that Asian students are more likely to persist, the rates for African American students are higher than expected, based on existing literature. Although this finding reveals some discrepancy from other findings, it is important to consider that this study was conducted at a single institution; thus, results are difficult to generalize.

When considering students with disabilities, Koch et al. (2018) found that students of color, as compared to White students, had higher likelihoods of non-persistence during both their first and second years. Likewise, in a study of students seeking disability support services, Herbert et al. (2014) found that being White was a significant predictor of degree completion at 4-year institutions. However, when other factors, such as GPA, were included in the analysis and other background characteristics were held constant, race and ethnicity were no longer significant predictors of degree completion. Such findings indicate that although a great deal is known about the relationship between race and ethnicity on retention rates, there are still some inconsistencies in the literature, and further exploration is warranted.

Socioeconomic Status (SES). Higher education serves students from varying socioeconomic backgrounds. Research shows that SES, which is often a measure of family income, parental education level and occupation, is an important predictor in retention and degree completion (Reason, 2003). As it relates to degree completion, of which retention or persistence are necessary components, Kena et al. (2015) found that by the age of 26, 14% of students from low SES backgrounds graduated, compared to 60% of students from high SES backgrounds. SES was derived as a composite of parents' education level, occupation, and family income, with the lowest quartile representing those of low SES and the uppermost quartile representing those of high SES.

Rather consistently in recent years, research has found that students of lower SES are more likely to drop out or not be retained in comparison to their peers belonging to mid or higher SES (Chen, 2012; Swecker et al., 2013). For example, Chen and St. John (2011) found that the odds of persisting in college are 55% higher for students from high SES backgrounds compared to those from low SES backgrounds. Additionally, the likelihood of students persisting to their second year also increases when their family contribution to educational expenses is greater, a feature more prevalent in students of higher SES (Olbrecht et al., 2016).

When comparing students with and without disabilities, Lee et al. (2015) found that SES was the only factor from a set of background characteristics that was associated with persistence for students with disabilities. For students with learning disabilities, low SES has been found to be a risk factor for non-persistence in both the first and second year of college (Koch et al., 2018). While SES has generally been found to be a predictor of retention rates, Westrick et al. (2015) concluded that when compared to other factors, such as high school grades and ACT scores, SES was not as great a predictor of retention. Therefore, when considering multiple variables and their impacts on student retention, it is important to include SES.

College-Level Characteristics

College-level characteristics are those factors that are associated with a student's enrollment and experience throughout their college years. Several college-level characteristics have been cited in the literature as relating to college retention, including college GPA, financial aid, and major field. These factors will be reviewed in relation to their influence on the retention of college students within the general population, as well as for those with disabilities.

College Grade Point Average (GPA). College GPA has been studied extensively in relation to retention. Several studies have indicated that first-semester college GPA is the

strongest predictor of retention from the first to second year for college students (McGrath & Braunstein, 1997; Raju & Schumacker, 2015; Stewart et al., 2015). Furthermore, Westrick et al. (2015) concluded that college GPA was the strongest predictor of retention from the second to third year. In terms of factors impacting college retention, college GPA has the most consistent literature.

When considering students with disabilities, Mamiseishvili & Koch (2011) analyzed a nationally representative sample of college students and found that first-year college GPA was positively and significantly related to persistence from the first to second year. Specifically, the odds of persisting to the second year of college increased by a factor of 1.13 for every 0.50-point increase in college GPA. Similarly, Herbert et al. (2014) found that for students with disabilities who also sought disability supports, college GPA was a strong predictor of persistence and degree completion, even when controlling for background characteristics. Therefore, given the strong predictive relationship between college GPA and retention, it is critical to include this factor in an analysis of college retention for students with disabilities.

Financial Aid. Research regarding the impact of financial aid on student retention has varied. Recently, Stewart et al. (2015) found that at a large four-year public research institution, students who were awarded financial aid were significantly more likely to persist than students who did not receive financial aid. Such findings are consistent with historical trends in the literature (Cabrera et al., 1992; Ishitani & DesJardins, 2002; Pascarella & Terenzini, 2005; Voorhees, 1985; Whalen et al., 2009; Wohlgemuth et al., 2007). However, when considering specific types of financial aid, the current literature is not as conclusive.

It is important to note that with rising tuition rates, grants, specifically need-based grants such as Pell grants, have not been able to keep up with student need (College Board, 2013).

Financial aid, which was once predominantly comprised of need-based aid, has shifted more primarily to loans (Chen & Wiederspan, 2014). The shift to loan-based aid has put a financial strain and debt burden on students, especially African American students, those from low-income backgrounds, and those who are first-generation graduates (Chen & Bahr, 2021).

When considering the type of financial aid on retention, grants and scholarships have generally been significant predictors of retention, while loans either did not have an impact or had a negative impact. Millea et al. (2018) recently found that at a mid-sized public university in the southeastern U.S., merit-based scholarships increased the probability of retention by 12.5%, while athletic-based scholarships increased the probability of retention by 10%. Chen and DesJardins (2010) completed a more robust study utilizing data from both the Beginning Postsecondary Students Survey and the National Postsecondary Student Aid Study and concluded that there was a positive and significant effect of both merit and need-based student aid on retention. They also found a positive effect on retention for students who received subsidized loans but no significant impact on retention for unsubsidized loans.

For students with disabilities, the influence of financial aid on retention has not been closely examined. However, as Lombardi et al. (2012) concluded, students with disabilities tend to have more financial stress and greater need for student aid, so it is important to consider both the receipt of financial aid and the type of aid received when examining potential impacts on retention for this population.

Major Field. Compared to other factors influencing retention rates, major field of study has not been as extensively reviewed. The literature surrounding college major often incorporates other factors into the analysis. Therefore, major alone has not been widely found to be a predictor of retention in higher education when not examining one specific field or other

factors that may impact retention in combination with major field. The National Student Clearinghouse (2019) found that for students entering a baccalaureate degree program in the fall 2017 semester, 85.3% in engineering majors were retained, followed by 80% in biological and biomedical sciences, 76.7% in liberal arts and humanities, 76.3% in health, and 77.1% in business and management. These findings are different for students entering associate degree programs, with retention rates being lower across all majors. For these students, liberal arts and humanities majors had the highest retention rates (54.7%), followed by computer, information, sciences, and support services (57%), health (54.7%), business and management (51.8%), and security protective services (51.5%).

Differences in retention do exist for first-year students who declare a major versus those who are undeclared. Leppel (2001) found that students with an undeclared major have the lowest persistence rates from year one to year two. When taking sex into account, females in education and health majors had higher persistence rates compared to those in business majors. The opposite finding was true for males, with higher persistence rates among males in business majors. More recently, Flanders (2017) examined retention rates of first-year college students and found that those who took a gateway course, typically a foundational level course, within their declared major during their first semester had higher retention rates. Finally, when considering the impacts of both major and race on retention, John et al. (2004) found that White students who were undeclared or social sciences majors were less likely to persist from year one to year two. For African American students, having an undeclared major was not a significant predictor of persistence; however, being in a business, health, engineering, or computer science major was positively related to persistence. Such findings highlight the importance of examining the relationship between major field and retention, along with any interactions with other

background factors. This is especially true for students with disabilities, as research on the topic is not readily available.

Retention Factors in Higher Education for Students with Disabilities

As outlined in Tinto's (1975) Model of Voluntary Student Departure and Aquino's (2016) Disability-Diversity (Dis) Connect Model, academic and social integration are essential to a student's success and retention in higher education. This factor is especially true for students with disabilities, who often cite poor relationships with faculty, social isolation, and lack of support from peers and campus organizations as barriers to retention (Kutscher & Tuckwiller, 2018). For students with specific learning disabilities, academic and social integration have also been found to be predictors of persistence (DaDeppo, 2009). The decision to disclose a disability at the postsecondary level and to seek out accommodations is also an important consideration in student retention. In reviewing the existing literature on students with disabilities, the influence of disability status on retention will first be explored. Academic integration, social integration, and accommodation use will be discussed individually to provide the greatest amount of clarity and specificity.

Disability Status

While the research on retention of students in higher education has been extensive, few studies have focused solely on students with disabilities (Koch et al., 2014). When comparing disability status, mixed results exist regarding retention rates between students with and without disabilities. In a longitudinal study of students at a four-year institution in the Midwest, Wessel et al. (2009) found that retention rates for students with disabilities compared to those without disabilities were similar, with only slight differences at the fourth and fifth year. On the contrary, in an analysis of national, longitudinal data, Koch et al. (2018) found that disability status

significantly contributed to persistence rates, regardless of both background characteristics and in college experiences, such as residency status and social and academic integration. It is likely that given the academic and social challenges that students with disabilities face in higher education, the more recent, nationally representative findings by Koch et al. (2018) would hold true today.

Academic Integration

Academic integration typically encompasses a student's involvement in activities and relationships that help them to face academic demands and fulfill academic goals (Aquino, 2016). This integration specifically addresses how these activities and relationships are perceived to promote or expand intellectual growth and the development of attitudes, beliefs, and values (DaDeppo, 2009). Such integration has been measured by activities, such as meetings with academic advisors and utilization of academic supports, such as study groups, office hours, tutoring services, and relationships with faculty.

For students with disabilities at the secondary level, inclusion in a general education classroom for core content areas has been identified as a predictor of participation in postsecondary education (Weiss & Faggella-Luby, 2020). Joshi and Bouck (2017) found that the odds of being engaged in postsecondary education were higher for students who were included in the general education setting. More specifically, Theobald et al. (2019) found that for 12th-grade students, inclusion in the general education setting for more than 80% of the day was a positive predictor of graduation and enrollment in postsecondary education.

For students at the postsecondary level, extensive research has been conducted on the influence of various academic supports and faculty interactions on student retention from the first to second year and beyond. For instance, Mamiseishvili and Koch (2011) examined first to second year persistence of students with disabilities. Utilizing a national, longitudinal dataset,

they found a significant relationship between the use of academic supports (e.g., study groups and office hours), social interaction with faculty, meetings with advisors and persistence. During the 2003-2004 school year, only 22.5% of students who utilized these services did not persist into their second year, compared to 31.5% of students who never utilized any of these supports. However, these findings were not significant when controlling for other factors, such as background characteristics, residency status on campus, first-year GPA, academic integration, and social integration, in a final logistic regression model. When utilizing data from the same survey, Koch et al. (2018) found inconsistent results. Their findings indicated that students with learning disabilities—even those who were more academically integrated via participation in study groups, social contact with faculty, meeting with academic advisors, and speaking with faculty about academic matters outside of class time—withdrew from their institutions at higher rates than those without disabilities.

When examining the impact of the frequency of academic advising on persistence, a significant association has been found between how often first-year students meet with their academic advisor and first-to-second year persistence rates (Koch et al., 2014). Consistent evidence to support the link between the frequency of academic advising sessions and persistence into a student's third year of postsecondary education has also been found (Kutscher & Tuckwiller, 2018; Mamisheishvili & Koch, 2012). This link indicates that utilization of services alone may not be a predictor of retention, but also the frequency or quality of service may be an important factor.

In addition to the utilization of academic supports, relationships with faculty and faculty perceptions have been identified as important predictors of retention for students with disabilities. Past research has indicated that students typically feel misunderstood or stigmatized

due to their disability. For instance, feelings of judgement, humiliation, and embarrassment by instructors have been frequently cited as barriers to academic success (Hong, 2015). Discrimination and perceptions of marginalization by faculty members have been associated with a sense of inadequacy, leading to a feeling of a lack of belonging or integration into a higher education setting (Timmerman & Mulvihill, 2015). Such perceptions and feelings have been associated with lower retention rates for these students (Thomspon-Ebanks, 2014).

Furthermore, students with specific learning disabilities who typically take longer to complete assignments or who have to put greater effort into completing assignments typically feel misunderstood by their instructors and can be mistaken as being unmotivated or unintelligent (Denhart, 2008; Hong, 2015). Experiencing these types of negative perceptions impacts a student's sense of value and self-esteem, forming greater barriers to academic integration and retention. On the other hand, those who feel accepted by their instructors are able to develop greater support systems, which aids in academic integration and ultimately in higher retention rates (Anctil et al., 2008; Coriale et al., 2012; Getzel & Thoma, 2008).

Social Integration

Although academic integration encompasses some degree of socialization, the concept of social integration relates more specifically with peer interactions and feelings of inclusion and belongingness (Aquino, 2016). Research regarding the importance of social integration in persistence has been slightly more conclusive than that on academic integration. In fact, for students with learning disabilities, social integration has been found to be a significant predictor of persistence, even beyond background characteristics, past academic achievement, and academic integration (DaDeppo, 2009). Therefore, while background factors and academic

integration are important considerations, social integration may be the most important predictor of retention for students with disabilities.

Feelings of inclusion and belonging are essential components of social integration (Leake et al., 2014). Research has indicated that students who feel social acceptance and a sense of belonging at their institutions are more likely to develop supportive social networks and to be retained at that institution (Antonio, 2001; Leake et al., 2014; Thomas, 2000). However, those who do not feel this sense of belonging at an institution within their first eight weeks have higher likelihoods of dropping out (Raley, 2007). This is especially relevant for students with disabilities who often face greater levels of stigmatization and social exclusion (Mamiseishvili & Koch, 2011). Several qualitative studies have found that social exclusion and feelings of isolation are significant barriers to college retention for students with disabilities (Coriale et al., 2012; Megivern et al., 2003).

On the other hand, social integration through peer interactions has consistently been found to be a predictor of retention. Mamiseishvili and Koch (2011) examined social integration factors such as participation in fine arts, intramural or varsity sports, and school clubs and found that students with disabilities who participated in an activity at least once had a greater likelihood of persistence from their first to second year. Specifically, those who engaged in a social activity did not persist only 18.9% of the time compared to 27.4% of the time for those who never participated in any of these social activities during their first year.

Participation in disability-specific social support groups has also been identified as a positive predictor of student retention and success. Students with learning disabilities who were able to befriend others with similar disabilities identified these relationships as positive influences on their academic and social integration (McCleary-Jones, 2008; Skinner, 2004). On

campuses where disability-specific peer support groups or peer study groups were available, these services were also mentioned as being beneficial (Thompson-Ebanks, 2014). Given these findings, it is important to consider both formal and informal peer interaction and integration factors when examining the retention of students with disabilities.

One other variable that has been associated with both academic and social integration is student residency status. For the general student population, research has indicated that living on campus provides greater opportunities for both academic and social integration, resulting in greater chances of persistence (Pascarella & Terenzini, 2005). These findings were confirmed for students with disabilities. Students with disabilities who lived on campus were almost 2.5 times more likely to persist from their first to their second year compared to students who lived off campus (Mamiseishvili & Koch, 2011). Consequently, residency status may be included as a predictor of both academic and social integration and thus retention.

Accommodation Use

For students who self-disclose a disability, accommodation provision and use have been found to be essential components of success (Dong & Lucas, 2016). In their study of students with disabilities at degree-granting postsecondary institutions, Raue and Lewis (2011) identified additional exam time as the most common accommodation provided to students with disabilities. Classroom notetakers, faculty-provided written course notes or assignments, faculty support with learning strategies or study skills, alternative exam formats, adaptive equipment and technology were also identified as common accommodations provided to students with disabilities by most higher education institutions (Newman & Madaus, 2015).

Regardless, accommodation use has been examined only sparsely in the literature as an essential element of student retention. More so, the research that does exist has many limitations

and inconsistencies. Newman et al. (2015) found that while 98% of postsecondary students with disabilities received some form of accommodation, modification, or related service in high school, only 24% did at the postsecondary level, indicating a major reduction in services utilized. By the time these students enrolled in college, 50% felt that they no longer had a disability, and only 35% chose to disclose their disability. It is unclear whether this discrepancy is the result of students not fully understanding their disability and the rationale for accommodations, or the differences in requirements between postsecondary and higher education for disclosing a disability and receiving accommodations. Additionally, due to limitations associated with funding and staffing, many institutions of higher education are limited in the types of accommodations that they can provide to students (Lichiello, 2012). This limitation is concerning, as research has indicated that the underutilization of accommodations for students in need often has a negative impact on persistence (Getzel, 2008).

When examining students who requested accommodations at the postsecondary level, Dong and Lucas (2016) confirmed that students who requested and received accommodations were more likely to demonstrate stronger academic performance through continuous enrollment in good academic standing, with a GPA of about 2.00. More recently, Newman et al. (2020) examined the effects of accessing supports on student persistence. They found that students who received any type of support were more likely to persist in either their 2- or 4-year program. However, while students who accessed universally available supports (e.g., tutoring, writing centers available to the entire student body) were more likely to persist, there was no significant relationship for students who received only disability-related services. Such a finding indicates that the use of accommodations and services alone is not enough to impact persistence but that it is important to analyze the effectiveness of specific supports utilized.

Previously, two quantitative studies examined the impact of accommodation use on persistence and graduation rates. Both studies found a positive association between accommodation use and persistence or graduation (Mamiseishvili & Koch, 2011; Pingry O'Neill et al., 2012). Furthermore, these studies identified several accommodations that were more significantly related to better student outcomes. Mamiseishvili and Koch (2011) found that course substitutions or waivers, readers, and classroom note-takers or scribes were all significantly associated with first to second year persistence. Pingry O'Neill (2012) found additional accommodations that were significantly related to student success and graduation rates, including physical therapy, alternate format or distraction-free testing, flexible due dates, and instruction on learning strategies. Qualitative studies have also confirmed the importance of accommodation use, with students indicating that the accommodations they received were important to their academic success (Thompson-Ebanks, 2014; Timmerman & Mulvihill, 2015). Given the demonstrated impact of accommodation use on student success, it is important to consider this factor in future research on the retention of students with disabilities.

Other Retention Factors in Higher Education

In addition to the factors already discussed, there are several other predictors of retention in higher education, such as age, first-generation status, SAT/ACT scores, high school GPA, individual resiliency/motivation, disability type, and disability disclosure. While these factors are important indicators, they will only be reviewed briefly, as they will not be included in the conceptual model outlined for this study. Due to overlap with other factors, such as the inclusion of first-generation status in the socio-economic status variable, the predictive relationship of SAT/ACT scores and high school GPA on college GPA, and the necessity of disability disclosure for accommodation use, these factors will not be included. Limitations relating to

available measures within the dataset also preclude the inclusion of individual resiliency/motivation and disability type variables. However, to provide a more thorough understanding of all factors relating to retention in higher education, these predictors will be reviewed before a conceptual model is proposed.

Age. Age is a factor that has frequently been considered in the literature on retention. While most research examining retention has utilized traditional undergraduate students aged 18 through 22 (Reason, 2003), the increasing number of nontraditional college students above the age of 25 means that this age range can no longer be considered in isolation (Pascarella & Terenzini, 1998; Reason, 2003). In terms of age and retention within the general population, research has shown that students entering college age 20 or younger are typically retained at a higher rate than those students that enter college at age 25 or older (National Student Clearinghouse Research Center, 2019). However, such findings are not entirely conclusive. For instance, in a quantitative study examining various predictors of retention and graduation rates, Wohlgemuth et al. (2007) found that there was no significant relationship between age and retention, and age and graduation rate.

In terms of the influence of age on the retention of students with disabilities, there are differences in retention and graduation rates for different age groups. For instance, Pingry O'Neill (2012) found that for students with disabilities, the odds of graduating were 5.4 times higher for students between ages 23 and 30 than for students between ages 15 and 22. Additionally, the odds of graduating were 2.9 times higher for students ages 31 and over than for students between ages 15 and 22. This finding suggests that students above the traditional college-age group of 18 and 22 have higher likelihoods of graduating. McGregor (2016) similarly concluded that students with disabilities are older than the traditional college-aged

student upon first enrolling. Even when considering students with disabilities apart from the general population, the impact of age on retention is not convincing. Contrary to these findings, Mamiseishvili and Koch (2011) concluded that for students with disabilities, age was negatively related to retention. Specifically, they found that the older the student, the less likely they were to be retained from their first to their second year of college.

For the purpose of this study, age will not be included as a factor. During the base year (2009), data from the HSLS:09 was collected from high-school-age students only. Thus, most respondents surveyed during the base year and the first follow-up were born between 1992-1996 and would be traditional college-age students during the second follow-up in 2016. Differences in retention associated with traditional versus non-traditional aged college students would therefore not be apparent from this sample.

First-Generation Status. First-generation college students are those who are the first in their family to attend college, with neither parent having previously attended college nor attained a college degree (Padgett et al., 2012; Stebleton et al., 2014). As of 2010, approximately 4.5 million postsecondary students in the United States were first-generation college students (Pryor et al., 2011). Compared to their peers, first-generation students tend to come from lower SES backgrounds (Soria & Stableton, 2012), be racial or ethnic minorities (Stebleton et al., 2014), and rely more on student loans (Lee & Mueller, 2014). Additionally, when compared to peers whose parents have some college experience, first-generation students have lower enrollment rates and are less likely to persist in higher education (Cataldi et al., 2018).

By the end of their first year in college, first-generation students are four times more likely than their peers to drop out (Engle & Tinto, 2008). Additionally, during their first four years in college, these students are 8.5 times more likely than their peers to drop out (Ishitani,

2006). Although there is limited research surrounding the retention of first-generation students with disabilities, the research that does exist is consistent with these findings, as these students are more likely to drop out during their first or second year when compared to peers without disabilities (Koch et al., 2018). Research has demonstrated that concerns regarding financial security, perceived academic competence, and a sense of belonging all impacted the retention of first-generation students (Pratt et al., 2017). Those who felt a sense of community and social support and had help developing skills to meet their academic expectations were more likely to be retained (Schelbe et al., 2019; Soria & Stebleton, 2012).

SAT/ACT Scores. The Scholastic Assessment Test (SAT), previously called the Scholastic Aptitude Test, as well as the American College Test (ACT), are two of the most commonly utilized college entrance exams in the United States. Although these assessments claim to be helpful in determining college readiness, research regarding the influence of SAT/ACT scores on college retention has been inconclusive. While some researchers have demonstrated a positive relationship between SAT and ACT scores and college retention (Stillman, 2007; Tracey & Robbins, 2006; Westrick et al., 2015), others (Bowen et al., 2009; Pascarella & Terenzini, 1983; Saunders-Scott et al., 2017) have not found any significant relationships between SAT and ACT scores and college retention or dropout rates. Through a hierarchical linear regression, Tracey and Robbins (2006) demonstrated a significant relationship between ACT scores and persistence for first-year students across 87 colleges and universities. More recently, Westrick et al. (2015) also found that ACT scores were a significant predictor of first- and second-year college performance, as well as second- and third-year college retention.

Conversely, Bowen et al. (2009) found that when compared to SAT scores, high school grades were a better predictor of graduation rates. Saunders-Scott et al. (2017) found similar

results when considering the impact of ACT scores. More specifically, they found that while ACT scores were able to predict college GPA well, they were not able to predict retention. As with the SAT, high school grades were a better predictor of college GPA and retention than ACT scores. One of the major criticisms of utilizing SAT and ACT scores to predict retention is that students of higher SES backgrounds tend to achieve higher on the SAT and ACT (Stewart et al., 2015), indicating that these scores are more correlated with SES than college performance. Stewart et al. (2015) concluded that when taking background variables into account, ACT scores were not able to predict college retention as well as either high school or college GPA, compared to when background variables, such as SES, were not included.

Although there is sparse research on the impact of SAT and ACT scores on the retention of college students with disabilities, one study found that only SAT quantitative scores were associated with retention rates and only for females (Wessel et al., 2009). Research surrounding this topic tends to indicate that for students with specific learning disabilities, traditional measures of academic achievement, such as SAT or ACT scores, are not good predictors of college success or retention (DaDeppo, 2009). This relationship may be because students with specific learning disabilities often enter college with lower academic achievement scores but are successful in college through other means, such as integration or accommodation use.

High School GPA. In their most recent analysis, the U.S. Department of Education (2009) found that the national high school GPA on a 4.00-point scale was 3.00. When considering the influence of high school GPA on college retention, research indicates that higher high school GPA is positively correlated with retention. For instance, Westrick et al. (2015) found that high school GPA was a significant predictor of better first- and second-year college performance, as well as second- and third-year college retention. Similarly, Hurford et al. (2017)

concluded that a GPA lower than 3.00, combined with other factors, such as low academic integration, predict significantly lower retention rates among students. While Stewart et al. (2015) found high school GPA to be a predictor of retention at the same institution through the first year, an inverse relationship existed between high school GPA and retention beyond the first year. Although significant, these results must be interpreted cautiously, as they apply to a sample at a single institution only.

In terms of students with disabilities, high school GPA has also been found to be positively correlated with first to second year persistence (Koch et al., 2014). However, when considering students with specific learning disabilities, high school GPA was not a significant factor in terms of retention. DaDeppo (2009) found that for these students, high school GPA was not a good predictor of college retention and was not as strongly correlated as other predictors of college retention, such as college GPA. Instead, academic integration factors were found to be greater predictors of retention than high school GPA. Therefore, when considering the retention of students with disabilities, it is important to consider the influence of high school GPA, as this relationship may be different than that which exists for the general college population.

Individual Resiliency/Motivation. Several personal characteristics have been associated with the persistence of students with disabilities in postsecondary institutions: self-awareness, self-efficacy, autonomy and goal setting, empowerment, perseverance, and self-advocacy (Kutscher & Tuckerwill, 2018). Many of these characteristics are related to resiliency or motivation, or the incentive needed to satisfy an internal or external goal. In a qualitative study examining the factors encouraging college retention of students with disabilities, Rigler (2013) identified resiliency, or the ability to overcome adversity, as the most powerful theme among respondents asked about why students with disabilities chose to stay in school. She

concluded that resiliency allowed these students to develop the self-determination and advocacy skills necessary to seek out support for their disabilities and prove that they could persist.

Disability Type. While research surrounding disability status is limited, there is existing literature regarding differences in retention rates for students with different types of disabilities. Generally, disability types are grouped into three categories: psychological, cognitive, and physical, and are further sorted into apparent and non-apparent disabilities. Psychological disorders are typically those that require a psychiatric diagnosis, such as anxiety, depression, bipolar disorder, or schizophrenia (Pingry O'Neill et al., 2012). Such disorders are classified as non-apparent, as they are not visibly noticeable to the general public. Cognitive disorders, such as specific learning disabilities, attention deficit hyperactivity disorder, dyslexia, or traumatic brain injury, are also classified as non-apparent disabilities. Physical disabilities are typically those which are apparent, such as deafness/hearing loss, blindness/visual impairment, orthopedic impairments, or other impairments that impact the body physically (Pingry O'Neill et al., 2012; Wessel et al., 2009).

When considering disability type, students with cognitive disabilities, such as specific learning disabilities, have lower retention and graduation rates compared to students with other types of disabilities and those without a disability (DaDeppo, 2009; Flink & Leonard, 2019; Matesic, 2020; McGregor et al., 2016; Newman & Madaus, 2015). Dong and Lucas (2016) also found that while students with cognitive disabilities tend to drop out within their first four semesters, similar patterns were also seen for students with psychological disabilities. Therefore, the exact differences in retention between students with cognitive and psychological disabilities are not well understood. On the other hand, students with physical disabilities have been generally found to be retained more often and demonstrate higher rates of degree completion

compared to those with cognitive or psychological disabilities (Dong & Lucas, 2016; Pingry O'Neill et al., 2012).

Disability Disclosure. In order to integrate into college life both academically and socially, students with disabilities often need specialized supports (Troiano et al., 2010). However, to receive these supports, students must self-disclose their disability. Often, students arrive at college either unprepared or unwilling to disclose their disability (Getzel, 2008). In large part, this has to do with the divide in disability identification between K-12 and higher education. Whereas at the elementary and secondary levels, the burden of disability identification and support lies with the school, at the postsecondary level, this burden lies with the student (McGregor et al., 2016). At the postsecondary level, students can no longer rely on their parents or school to provide the supports necessary for their success. Due to this disconnect and lack of self-advocacy at an earlier stage, students often arrive at college without the self-advocacy or self-determination skills necessary to know their rights and responsibilities (Cole & Cawthon, 2015; DaDeppo, 2009).

There is a great deal of literature that outlines the connection between self-advocacy, self-determination, disability disclosure, accommodation use, and college success (Getzel et al., 2004). Students must first be able to accept their disability and be able to evaluate how the disability affects their learning. They must also understand their needs, analyze which services would best support these needs, and be able to communicate this information clearly to college personnel. They must also have the resiliency and determination needed in order to overcome barriers to receiving these types of supports (DeFur et al., 1996; Getzel et al., 2004).

Regardless of the growing body of evidence supporting the benefits of self-disclosure on academic achievement, relatively few students choose to self-disclose their disability at the

postsecondary level. Lack of knowledge regarding the need for self-disclosure and fear of stigmatization surrounding self-disclosure have been identified as potential barriers (Flink & Leonard, 2019). Among students who have received special education services during their secondary education, the number of students who disclose their disability at the postsecondary level ranges from only 24 to 35% (Newman & Madaus, 2015; Zeng et al., 2018). These numbers may be an underrepresentation due to privacy restrictions, which prevent higher education institutions from knowing which students have been eligible for special education without their consent.

A number of explanations have emerged focusing on why students fail to disclose their disability at the postsecondary level. In some cases, students have indicated that they did not need any support and therefore did not see a need to disclose their disability. These students often indicate that they want to try college without supports at first (Cole & Cawthon, 2015; Williams et al., 2020). Unfortunately, these students often do not self-disclose until they are in danger of academic failure (Farmer et al., 2015; Richman et al., 2014).

Students also fail to disclose their disabilities due to an awareness of the stigmatization and negative perceptions associated with having a disability. Students have indicated a fear associated with how their professors may perceive them for having a disability (Hong, 2015) or the ability of the faculty and staff to keep their disability confidential (Barnard-Brak et al., 2010). Unfortunately, this fear of disclosure has led to student needs being underserved and thus lower retention rates (Flink & Leonard, 2019).

Conceptual Model

The following conceptual model (Figure 1) is based on Tinto's (1975) Model of Voluntary Student Departure and Aquino's (2016) Disability-Diversity (Dis) Connect Model.

This model outlines the specific factors that are predictors of retention of students with disabilities in higher education, including background characteristics, college-level characteristics, social and academic integration factors, and accommodation use. These factors will be explored in greater detail in the following chapter.

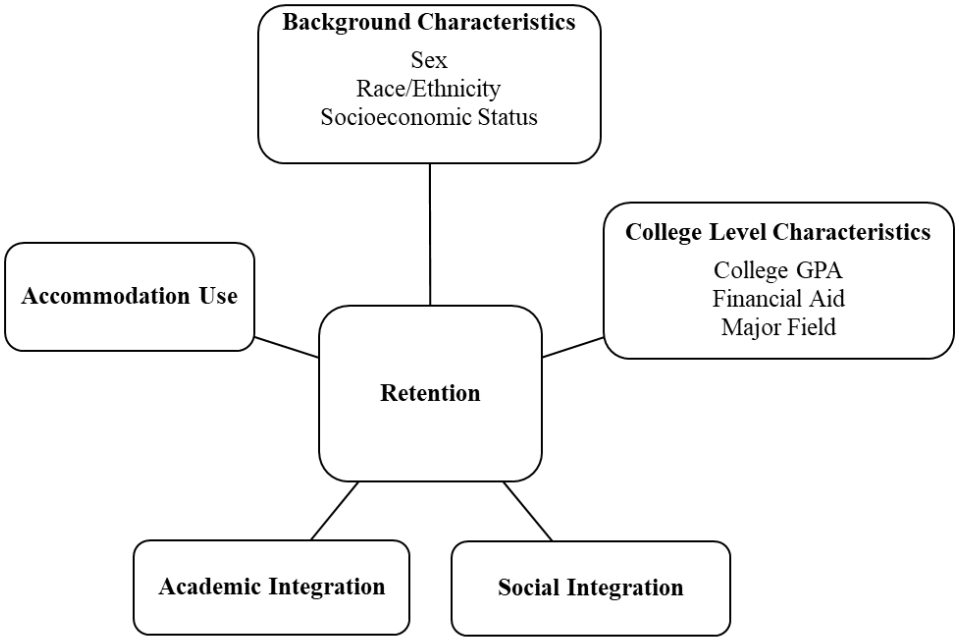

Figure 1. Conceptual Model of Retention for Students with Disabilities in Higher Education adopted from Tinto's (1975) Model of Voluntary Student Departure and Aquino's (2016) Disability-Diversity (Dis) Connect Model

Limitations of Current Literature

While there is a considerable amount of literature exploring the retention of students in higher education, a specific focus on the retention of students with disabilities is lacking (Herbert et al., 2014; Peña, 2014). Much of the existing research is largely qualitative in nature, focusing on student perceptions and experiences (Flink & Leonard, 2019; Timmerman & Mulvihill,

2015). Quantitative research utilizing large, nationally representative samples is limited, and the research that does exist relies primarily on samples of local students only (Koch et al., 2014). Therefore, it is difficult to generalize these findings to students at different types of institutions.

More so, existing research on students with disabilities tends to lack differentiation. Most studies tend to focus on disabled versus non-disabled students in a binary fashion, only differentiating between students with disabilities and students without disabilities (Abreu et al., 2017; Kranke et al., 2013). Few studies exist that focus on the retention of students with specific learning disabilities rather than the general population of students with disabilities.

Additionally, when reviewing specific predictors of retention for students with disabilities, the literature is inconclusive regarding many background characteristics, including age, race/ethnicity, and SES. Little to no research exists on the relationship between retention and major field and financial aid for students with disabilities. Research on high school GPA also appears to differ for the general student population compared to students with disabilities. Given these limited and inconsistent findings, it is important to further investigate these factors.

The literature regarding the influence of accommodation use on retention is also sparse. To date, only one empirical study has examined the impact of accommodation use or disability-related services on retention in a quantitative manner (Mamiseishvili & Koch, 2011). While qualitative research exists, which examines the impact of accommodation use on student success (Thompson-Ebanks, 2014; Timmerman & Mulvihill, 2015), such studies have limited sample sizes and are strictly anecdotal, indicating a need for additional quantitative research to examine the impact of accommodation use on retention. These studies are also limited in their ability to identify why certain accommodations are more effective in student success than others.

Another limitation of existing literature is that few studies are current. A vast majority of the most recent research on this subject was completed around 2011-2012 and is now a decade old. In addition to a lack of current findings, there also tend to be few ongoing, longitudinal studies that examine the outcomes of students with disabilities in higher education over time. It is apparent that the majority of the existing research is completed around the time when new legislation is passed or requirements are updated. It is critical to continue this research not only when required but more regularly to better understand trends.

Aside from the lack of consistent and current research surrounding this topic, one of the major limitations is the absence of a comprehensive and well-established theory or conceptual model regarding the retention of students with disabilities—one that also examines the impact of accommodation use. While conceptual frameworks regarding retention of the general student body have existed and been studied for decades, Aquino's (2016) Disability-Diversity (Dis) Connect Model is the only one that seeks to explicitly examine the experiences of students with disabilities and separate this characteristic from other diversity characteristics. Additionally, the use of accommodations is not clearly established as a predictor in any established model. While accommodation use is sometimes included as a factor, it is typically haphazardly grouped together with other academic and social integration factors without much context or other clarification.

CHAPTER III

METHODOLOGY

This chapter will focus on the design and methodology of this quantitative study. I will begin by outlining the overall purpose of the study and the guiding research questions. I will then explain the conceptual model, which was utilized as a framework for the study. Descriptions of the data source, population, and samples will also be given. Variables included in the research design based upon the conceptual model are described, along with specifics regarding the descriptive and inferential analyses that were completed. Finally, I will conclude with a discussion of the limitations of this study.

Purpose

The purpose of this study was to examine the factors that predict first year retention of students with disabilities at four-year public and private institutions of higher education in the United States. A specific focus was placed on students who self-identify as having specific learning disabilities, as these students are less likely to be retained than students identifying within any other disability group (Matesic, 2020). Additional attention was placed on the relationship between accommodation use and the retention of these students. Specifically, whether a student received an accommodation or service at a postsecondary institution to help support a disability need, such as early registration, testing support or counseling, was considered when examining retention. In addressing these issues, this study adds to the limited quantitative research available on the retention of students with disabilities and the impact of accommodation use in higher education. The findings of this study can also be utilized to inform university policy surrounding best practices in serving students with disabilities in higher education.

Research Questions

This study seeks to answer the following research questions:

4. Is the existence of any disability related to first-year retention?
5. Controlling for other factors, are students with disabilities who utilize accommodations retained at a higher rate than those who do not utilize accommodations?
6. Among students with specific learning disabilities, are those who utilize accommodations retained at a higher rate than those who do not utilize accommodations, controlling for other factors?

Conceptual Model

The following conceptual model (Figure 2) is based on Tinto's (1975) Model of Voluntary Student Departure and Aquino's (2016) Disability-Diversity (Dis) Connect Model. This model outlines the specific factors that are predictors of retention of students with disabilities in higher education, including background characteristics (sex, race/ethnicity, socioeconomic status), college-level characteristics (college GPA, financial aid, major field), social and academic integration, and accommodation use. These factors have been examined thoroughly in past research as predictors of retention in higher education both within the general population and among students with disabilities. Each of these factors will be examined in greater detail in the following section.

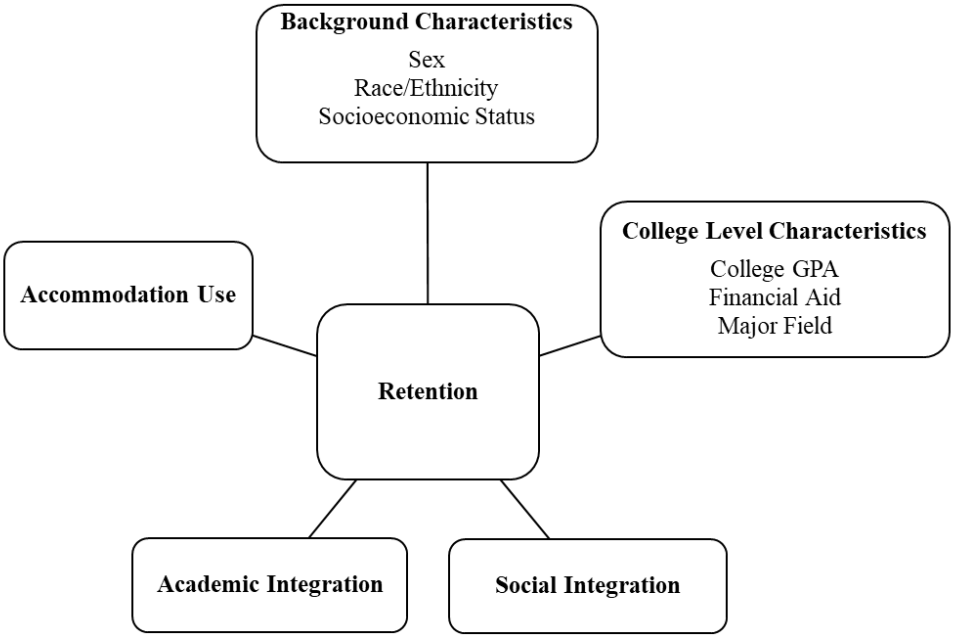

Figure 2. Conceptual Model of Retention for Students with Disabilities in Higher Education adopted from Tinto's (1975) Model of Voluntary Student Departure and Aquino's (2016) Disability-Diversity (Dis) Connect Model

Data Source and Sample

High School Longitudinal Study

The High School Longitudinal Study of 2009 (HSLS:09) is the fifth study in a series of studies completed by the National Center for Educational Statistics (NCES). This survey was sponsored by the National Center for Education Statistics, which functions within the U.S. Department of Educations' Institute for Educational Sciences. The NCES is the federal entity that is primarily responsible for data collection, analysis, and reporting as it relates to education within the United States and among foreign countries (Ingels et al., 2011).

The purpose of this longitudinal study was to monitor the transition of students from high school through their postsecondary years (Ingels et al., 2011). Specifically, this study sought to explore questions regarding transition plans from high school through postsecondary years, how these plans evolve, and how educational and social experiences affect these plans (Ingels et al., 2011).

During the base year (2009), information regarding students' backgrounds and previous experiences, as well as social contexts and interpersonal influences, were collected through surveys of students, parents, math and science teachers, school administrators, and school counselors. Questions specific to educational experiences and expectations, perceptions of mathematics and science as valuable subject areas, and sociodemographic background were included in this survey. Additionally, a mathematics assessment was completed as a measure of achievement but also as a predictor of readiness to enter STEM-related courses (Duprey et al., 2018). During the first follow-up (2012), questions specific to grade progression, school experiences, preparations for postsecondary education, mathematics and science engagement, and extracurricular activities were included (Duprey et al., 2018). Such questions explored constructs and interactions dealing with decision-making processes, especially decisions regarding high school courses and postsecondary options. Factors such as parental and school involvement, financial aid and motivation come into play. Again, a mathematics assessment was completed to measure achievement.

During the 2013 update, information regarding high school completion and dropout, application, and acceptance into postsecondary institutions, and plans for education and work, was collected (Duprey et al., 2018). During the second follow-up (2016), information that was previously collected, including postsecondary and work experiences, constraints during the decision-making process, and work experience specific to STEM fields, was again

collected. Additional information, including high school completion, experiences during high school, current and future plans for enrollment at postsecondary institutions, employment history, family and home characteristics, and personal characteristics, were included in the surveys (Duprey et al., 2018). The 2016 follow-up provided data on students three years following high school graduation.

The HSLS:09 is the most appropriate dataset to utilize for the purpose of this study, as it provides data regarding retention in higher education, disability status with a focus on students with learning disabilities, and accommodation use in higher education. Although other national datasets, such as the Beginning Postsecondary Study (BPS), provide some information regarding students with disabilities, the HSLS:09 is the only recent, national dataset with information regarding accommodation use, which is a large focus of this study. Therefore, the HSLS:09 is the most relevant and practical national dataset in terms of answering the research questions and generalizing these findings to other students or institutions.

Population

Target populations for the HSLS:09 were students from all public schools, including charter schools, as well as private schools. The target population included all 50 states and the District of Columbia. Schools must have been providing instruction at both the ninth and eleventh-grade levels during the 2009-2010 school year (Ingels et al., 2011). At the student level, the target population included all students who attended ninth grade during the 2009 term at one of the identified target schools. While all students who met these criteria were eligible to participate in this study, not all students were able to complete the study either due to language barriers or disabilities (Ingels et al., 2011).

Of the 1,889 schools that were eligible to participate in the base year of this study, a total of 944 schools were included in the sample. This sampling represents a 55.5% weighted (50.0% unweighted) response rate for schools (Ingels et al., 2011). From these 944 participating schools, 26,306 students were sampled. During the 2009 base year, 1,099 (4.2% unweighted) of these students were excluded from the study due to ineligibility criteria. This yielded a total base-year student sample size of 25,206. Regardless of responses or enrollment status, all 25,206 base-year students were included in the sample for the first follow-up in 2012. As of this first follow-up, 25,184 students remained eligible for the study. For the 2013 update, 25,168 students remained eligible for the study, and 25,167 remained eligible for the 2013-2014 high school transcript data collection phase. For the second follow-up in 2016, 23,316 students were found to remain eligible for the study and were included in the sample (Ingels et al., 2011). A total of 21,444 students completed this study, resulting in an 85.1% response rate for the study (Duprey et al., 2018). The HSLS:09 study utilized a two-step process for sampling. During the first phase, stratified random sampling was utilized to generate a sample of schools. During the second phase, random sampling was utilized to sample students from the selected schools (Ingels & Dalton, 2013).

Samples

The overall sample for this study included all full-time, degree-seeking students who were enrolled in or had already attained a degree from a 4-year public or private institution of higher education within the United States as of the second follow-up in 2016. This original sample was further refined to include two subsamples.

Subsample 1 served to answer research question 2 and included only students from the overall sample who identified as having a disability or special need, including but not limited to

serious difficulty concentrating, remembering, or making decisions, learning disabilities, deafness, blindness, or Attention Deficit/Hyperactivity Disorder (ADHD). While this disability variable may encompass several different types of disabilities, these are not specifically differentiated in the data. Therefore, students identifying as having any one of these disabilities were included in subsample 1. Subsample 2 served to answer research question 3 and consisted of only students from the overall sample who identified as having a learning disability, not including ADHD. Again, data are not specifically differentiated amongst different types of learning disabilities, so all students identifying as having any learning disability were included in subsample 2.

Data from both the 2012 and 2016 follow-up surveys were utilized, which included 23,503 respondents. Of these respondents, 10,879 indicated that they were enrolled at their first institution on a full-time basis. Furthermore, of these respondents, 7,909 indicated that they were enrolled at a four-year institution. Therefore, the overall sample was comprised of 7,909 individuals, approximately 33.6% of the population. Subsample 1 included 1,938 individuals who indicated that they had a disability or special need, approximately 24.5% of the original sample. Subsample 2 included 216 individuals who indicated that they had a specific learning disability, approximately 2.7% of the original sample.

Questions asked during this 2016 follow-up pertained to experiences in higher education since the first follow-up in 2012 and included the timeframe between high school graduation, college enrollment, and potential graduation. Questions specific to the first institution of enrollment allow for a deeper understanding of factors relating to first year retention at these institutions. Examining results from the 2016 follow-up also allowed for data inclusion of students who may not have enrolled in college directly following high school graduation. While

this sample may include students who delayed entry into college, there is no way to differentiate these students from others who entered college during any given year directly following high school graduation. Students enrolled at an institution of higher education anytime between the first follow-up in 2012 and the second follow-up in 2016 who were retained at that same institution from their first to second year of enrollment or who had already attained a degree from their first institution were included in this study. Students who were no longer enrolled at their first institution or who were enrolled at an institution other than their first institution were also included in this study but identified as those who were not retained. Students who had not ever enrolled at an institution of higher education or who had only enrolled during the 2016 academic year and had not reached their second year were excluded from this study, as there is no way to measure their first to second year retention.

Variables

Dependent Variable

Retention

Retention is defined as a first-time, full-time, degree-seeking student at a four-year institution continuing enrollment from their first to their second year at the same institution of higher education that they originally enrolled with (National Center for Education Statistics, 2020). The *attainment and retention at first institution: February 2016* variable in the HSLS:09 dataset identifies the student's degree attainment or enrollment status at their first institution as of February 2016. This variable differentiates the highest degree attained at the first institution, and if no degree has been attained at the first institution, whether the student was still enrolled at the institution, at a different institution, or no longer enrolled at any institution.

The retention variable was recoded as a binary, categorical variable with categories of bachelor's degree attained at the first institution and no degree attained at the first institution but still enrolled at the first institution coded as 1 = retained. Categories of no degree attained at first institution but enrolled at a different institution or not enrolled at any institution were coded as 0 = not retained.

Independent Variables

Past research has examined the impact of several different variables on students' first year retention in higher education, for both the general population and for students with disabilities. Based upon this literature and the proposed conceptual model, several independent variables were included in this study to more closely examine the impact that they have on retention. Variables were grouped into several categories, including background characteristics, college-level characteristics, social integration, academic integration, and accommodation use.

Background Characteristics

Sex. The *student's sex* variable is a binary, categorical variable based on the reported sex of the student as either male or female in the base year, parent questionnaire, or school-provided roster. This variable was recoded with 0 as Male and 1 as Female.

Race/Ethnicity. The *student's race/ethnicity* variable is a categorical variable with eight mutually exclusive categories: American Indian/Alaska Native, non-Hispanic; Asian, non-Hispanic; Black/African American, non-Hispanic; Hispanic, no race specified; Hispanic, race specified; more than one race, non-Hispanic; Native Hawaiian/Pacific Islander, non-Hispanic; White, non-Hispanic. This variable was recoded into a dummy variable with five categorical variables of White, Asian, Black/African American, Hispanic, and Other (American

Indian/Alaska Native, Native Hawaiian/Pacific Islander, or more than one race). White was utilized as the reference group.

Socioeconomic Status. The *socio-economic status composite* is a continuous variable that is a composite of parent/guardian's education, occupation, and family income. This variable was recoded as a categorical variable with three distinct categories, low SES, middle SES, and high SES. Recoding was consistent with the definitions outlined by the HSLS:09 base year public-use data documentation, which defined the 20th percentile as low SES, the 80th percentile as high SES, and all others as middle SES. As the *socio-economic status* variable was already standardized as a composite, I computed the 20th and 80th percentiles and recoded the variable accordingly to create the three categorical dummy variables: low SES, middle SES, and high SES. For further analysis, low SES was utilized as the reference group.

College Level Characteristics

College GPA. The *first-year enrollment: known GPA* composite is a continuous variable that indicates the student's cumulative grade point average during their first year of postsecondary enrollment as of June 2016. This data was collected through a review of postsecondary transcripts and applies to students who attempted undergraduate credits with grades available in their first year of enrollment in higher education. This variable has been standardized on a 4.00-point scale.

Financial Aid-Loans: The *total federal loans at primary first year institution* variable is a continuous measure of the total amount of Title IV loans that students received during their first academic year of postsecondary education and while enrolled at their first institution. This variable includes funding provided by Perkins loans, Federal Direct Loans, but excludes Parent

PLUS loans. This information was collected from the 2017 student record based on available National Student Loan Data System data. This variable was log-transformed with a base of 10.

Financial Aid-Merit: The *total merit-only grants at primary first year institution* variable is a continuous measure of the total amount of merit-only grants or scholarships, including athletic scholarships, that the student received during their first academic year of postsecondary education, and while enrolled at their first institution. This information was collected from the 2017 student record based on available National Student Loan Data System data. This variable was log-transformed with a base of 10.

Financial Aid-Need: The *total federal Title IV grants at primary first year institution* variable is a continuous measure of the total amount of total Title IV grants that the student received during their first academic year of postsecondary education and while enrolled at their first institution. This total includes Pell Grants, Supplemental Educational Opportunity Grants, TEACH grants, but excludes veteran's benefits and military aid. This information was collected from the 2017 student record based on available National Student Loan Data System data. This variable was log-transformed with a base of 10.

Major Field: The *reference degree major – sub baccalaureate categories* variable is a categorical variable based on the student's reported major or field of study declared or decided upon during the second follow-up interview (2016). This variable included 12 distinct major fields of study based upon the U.S. Department of Education's Classification of Instructional Programs. This variable was recoded into five dummy variables. Science, Technology, Engineering, and Mathematics (STEM) included Computer and Information Sciences, Engineering and Engineering Technology, Biological and Physical Science, Science Technology, Math, and Agriculture, and Military Technology majors. Humanities included Social Sciences,

Humanities, and Personal and Consumer Services majors. Business included all Business-related majors. Healthcare included all majors within the Healthcare fields. Other included General Studies, Manufacturing, Construction and Repair, Other Applied majors, and undeclared. Humanities was utilized as the reference group.

Disability Status. The *ever had disability or special need* variable is a binary, categorical variable that indicates whether or not the student self-identifies as ever having had a disability or special need, including serious difficulty concentrating, remembering, or making decisions, having had been told by a health or education professional that he/she had ADHD or ADD, had a learning disability, was deaf or had serious difficulty hearing, was blind or had serious difficulty seeing, or had any other disability or special need. Responses of no were coded as 0, and responses of yes were coded as 1. This variable was only included in the overall sample to differentiate students who do or do not have a reported disability.

Academic Integration. The *service used: academic support services* variable is a binary, categorical variable that indicates whether the student utilized an academic support service, including tutoring, writing centers, or visiting, emailing or communicating with and receiving information or help from a school office or department that offers a particular service, by the end of February 2016 or the date of last attendance at the first institution of enrollment. Responses of no were coded as 0, and responses of yes were coded as 1.

Social Integration. The *scale of student's sense of school belonging* is a continuous variable that is a measure of the students' perception of school belonging, with higher values representing a greater sense of belonging. This variable was standardized with a mean of 0 and standard deviation of 1. The inputs for this scale included statements regarding a sense of safety

and pride regarding school, ability to talk to others about problems at the school, importance of good grades, and feeling that school is a waste of time.

Accommodation Use. The *received accommodations for disability from any college or trade school* variable is a binary categorical variable that indicates whether the student received an accommodation or service for their disability from their institution by the end of February 2016 or the date of last attendance at the first institution of enrollment. While this variable does not specify the specific type of accommodation or service utilized, the survey question does provide examples of the various services that a student may have received that would indicate a "yes" response, such as early registration, test-taking accommodations, and counseling, indicating that accommodations may be academic or social in nature. This variable applied only to students who previously indicated that they informed their institution of their disability. Responses of no were recoded as 0, and responses of yes were recoded as 1

Research Design

The purpose of this study was to examine whether the existence of a disability is related to first-year retention. More specifically, this study sought to examine if accommodation use is related to a higher rate of persistence among students with disabilities, especially specific learning disabilities when controlling for other factors. This quantitative study utilized data from the High School Longitudinal Study to address the research questions. The research design utilized descriptive statistics as well as binary logistic regressions to examine the relationship between the dichotomous dependent variable of retention and the various categorical or continuous independent variables.

Data Management

Prior to conducting any descriptive or inferential analysis, data cleaning and management techniques had to be implemented. Several independent variables were recoded as outlined above, as was the dependent variable to create a binary, categorical variable. For categorical variables with more than two response categories, dummy variables were created to transform each of the categories into a series of new variables with values labeled 0 or 1. Dummy variables were created for categorical variables, including race/ethnicity, socioeconomic status, and major field. For instance, the race/ethnicity variable was transformed into five dummy variables: Asian, Black/African American, Hispanic, White, and Other.

For continuous variables that may have a skewed distribution, such as financial aid, log transformations with a base of 10 were also completed. Log transformations are necessary to apply to skewed data to normalize the distribution, making the interpretation of the data more meaningful (Feng et al., 2014). The socioeconomic status variable, which originated as a continuous variable, was recoded as a categorical variable according to the percentiles defined during base year data collection to ease in the interpretation of this variable compared to existing literature, which typically compares the socioeconomic status of low, middle, and high values. As the college GPA variable had already been normalized to a 4.0 scale, further transformation was not required.

In addition to recoding of data, missing data was also addressed. Although listwise or pairwise deletion could have been implemented to remove cases with missing data, doing so may cause limitations for the study by limiting statistical power and introducing sampling bias if too many missing values are deleted (Allison, 2001). Therefore, missing data analysis was completed to better understand the missing data.

Data ranged from no missing cases to 45% missing, necessitating a way to estimate missing values. Multiple imputation has been suggested as a method of estimating missing values by first creating several plausible datasets based upon the available data and combining results of each of these datasets to arrive at a single estimated value (Allison, 2012). Multiple imputation has also been suggested as a method of handling missing data when variables include more than three percent missing data (Allison, 2001). Therefore, this method was utilized to handle missing data. Among independent variables, eight had missing cases greater than three percent, including college GPA (23%), financial aid-loans (45%), financial aid-merit (42.8%), financial aid-need (45%), disability status (8.6%), social integration (9.7%), academic integration (7%), and accommodation use (8.9%). The dependent variable included missing cases less than one percent; thus, no imputations were necessary for this data.

It was important to consider the amount of missing data when deciding on how many imputations needed to be completed. Whereas 2-10 imputations were deemed sufficient in the past (Rubin, 1987), more recent research has suggested using more imputations, especially as the amount of missing data increases (Grahm et al., 2007). Therefore, 25 imputations, as standard practice in the field, were run on the dataset to account for the missing cases among the variables.

Descriptive Analysis

Descriptive analyses were run to summarize the samples. Measures of central tendency, including means and standard deviations, were outlined for all continuous variables in the overall sample, subsample 1, and subsample 2. For the overall sample, descriptive statistics were included to summarize the whole sample. Cross-tabulations, including percentages for characteristics of students with and without disabilities, were included for all categorical

variables. Percentages for characteristics of all students with learning disabilities were also included for subsample 2. Such analysis allows for a quick overview of the data and a comparison of the different samples.

Inferential Analysis

For this study, all three research questions sought to examine the impact of various factors on first year retention, which is measured as a dichotomous outcome. Due to the binary nature of the dependent variable, binary logistic regressions were run to answer all three research questions. Binary logistic regressions are appropriate to use when examining how one or more categorical or continuous variables may impact a dichotomous, categorical variable, such as retention (Harrell, 2015).

To address the first research question, "is the existence of any disability related to first-year retention," a binary logistic regression analysis was run to examine the relationship between the independent variable (disability status) and the dependent variable (retention). To answer the second and third research questions, "controlling for other factors, are students with disabilities who utilize accommodations retained at a higher rate than those who do not utilize accommodations" and "among students with specific learning disabilities, are those who utilize accommodations retained at a higher rate than those who do not utilize accommodations, controlling for other factors," two binary logistic regressions were run. The variables outlined above were included in the models as controls. Research question 2 utilized subsample 1, including only individuals from the overall sample who identified as having a disability. Research question 3 utilized subsample 2, including only individuals from the overall sample who identified as having a learning disability. Therefore, while research question 1 included

individuals with and without disabilities, research questions 2 and 3 only included individuals with a self-identified disability or learning disability.

To account for this complex survey design, a weight variable was included in the analysis. The HSLS:09 has several weights available for analysis. These weights are utilized to make sure the estimates of the sample are representative of the target population – U.S. students enrolled in the 9th grade during the 2009-2010 school year. The sampling weights included in this dataset account for the probability of selection, as not everyone sampled responded to the survey. Therefore, these weights account for differences in response patterns among various rounds of surveys to assure that the data are still representative of the population.

For the purpose of my analyses, the *Second follow-up, base year, first follow-up, and 2013 Update weight* was included as a weight variable. This student weight variable is appropriate to use in the analysis of variables from all base year, first follow-up, 2013 update, and second follow-up responding students, all of which have produced at least one variable utilized in my analysis. Such a weight variable is important to include in the analysis, as it reduces potential biases produced by oversampling (Scott & Ronald, 2001).

Limitations

As with any study, there exist limitations that require mention. First, the utilization of a secondary dataset in the form of a national study presents with limitations. While this dataset provides large population and sample sizes, which can be generalized more easily to other situations, it is not able to account for specific student experiences. Collecting primary data, whether quantitative or qualitative, would allow for a closer examination of students with disabilities. Specifically, the lived experiences and perceptions surrounding academic

integration, social integration, and accommodation use can be examined more in-depth through a research design aimed specifically at understanding those factors.

Additionally, utilizing a national dataset presents limitations related to the specific variables available for review. While the HSLS:09 provided a breadth of information on various factors over several years, there exist some limitations. Within this sample, there may be included students who have delayed entry into college. However, due to the limitations of reporting across several years, there is no way to differentiate these students from those who entered college directly following high school. This variation presents as a limitation, as students who delay entry into college may have characteristics or backgrounds that may influence retention differently than those who directly enter college.

There also exist limitations relating to the disability variable. For instance, apart from those with learning disabilities, there is no way to differentiate types of disabilities among students who identified as having a disability. These students simply reported that they had a disability, regardless of type. As type of disability has been identified as having an influence on retention, it is important to be able to differentiate amongst types of disabilities for a more comprehensive understanding. For those who identify as having a learning disability, the sample size is relatively small, less than 1 percent of the original sample size, and findings for this subsample may not be significant. Lastly, specific factors related to retention that may be important to examine for students with disabilities, including specific types of accommodation use, are not within the scope of this study.

Also related to the use of a secondary dataset, missing data is a major limitation. For this study, several variables had missing data, some with up to 45% missing cases. While the use of multiple imputations helps to address the missing data, such measures have the potential to

introduce bias into the data and limit generalizability to the larger population (Allison, 2012). The utilization of a restricted dataset or the ability to merge datasets that may include the missing data would help to alleviate this problem.

There are also limitations surrounding the use of more updated national datasets, as more recent studies and data, including adequate information regarding disabilities and accommodation use, are not readily available. Again, the collection of primary data with a specific focus on students with disabilities may prove beneficial.

The highly personal and private nature of the topics examined in this study leads to some limitations. For instance, this study relied on data based on self-reported disabilities and accommodation use. The use of archival data is a major limitation of this study due to the possibility of response bias. Lack of previous knowledge regarding a disability (Getzel, 2008), lack of information regarding how to disclose a disability (Mamiseishvili & Koch, 2011), or stigma related to disability disclosure (Hong, 2015) may lead to an underrepresentation of the true number of students with disabilities examined by this study. Due to the need to self-disclose a disability at the higher education level, it is not possible to truly examine all students with disabilities. Inherent biases in responding and missing information may also be evident in a survey design, as respondents may not wish to answer questions truthfully or fully. While there exist limitations of this study, findings may prove helpful in guiding public policy regarding best practices for supporting students with disabilities in higher education.

CHAPTER IV

RESULTS

This chapter focuses on the results of the descriptive and inferential analyses. These analyses aimed to answer the three research questions: (1) Is the existence of any disability related to first-year retention? (2) Controlling for other factors, are students with disabilities who utilize accommodations retained at a higher rate than those who do not utilize accommodations? (3) Among students with specific learning disabilities, are those who utilize accommodations retained at a higher rate than those who do not utilize accommodations, controlling for other factors?

Descriptive findings are first outlined for the overall sample, subsample 1, and subsample 2. For each of these samples, the means and standard deviations for all continuous independent variables are listed. For the overall sample, descriptive statistics are included to summarize the whole sample. Cross-tabulations, including percentages for characteristics of students with and without disabilities, are included for all categorical variables. This analysis provides a comparative analysis between the overall sample and subsample 1 of only students with disabilities. To further explore subsample 2 of only students with learning disabilities, separate frequency tables are included for all categorical variables. Additionally, the results of logistic regressions are outlined in the inferential findings section. These analyses are broken down further to address each of the three research questions.

Results of Descriptive Analysis

The target sample for this study included all full-time, degree-seeking students who were enrolled in or had already attained a degree from a 4-year public or private institution of higher

education within the United States as of the second follow-up in 2016. This original sample is further refined into subsample 1 and subsample 2.

Overall Sample

Data from both the 2012 and 2016 follow-up surveys were utilized for this sample, which included 23,503 respondents. Of these respondents, 10,879 indicated that they were enrolled at their first institution on a full-time basis. Furthermore, of these respondents, 7,909 indicated that they were enrolled at a four-year institution. Therefore, the overall sample is comprised of 7,909 individuals, approximately 33.6% of the population.

Table 1 displays the means and standard deviations for all continuous variables used within this study for the overall weighted sample of full-time, degree-seeking students who were enrolled in or had already attained a degree from a 4-year public or private institution of higher education within the United States as of the second follow-up in 2016, including those with and without disabilities.

The mean for the social integration composite was 0.23, and the mean college GPA was 2.91. For the log-transformed financial aid variables, 3.71 was the mean for loans, 3.71 for merit-based aid, and 3.58 for need-based aid.

Table 1
*Descriptive Statistics of Continuous Variables *Weighted – Overall Sample*

(N = 7,909)

Variable	Mean	Standard Deviation
Social Integration	0.23	0.89
College GPA	2.91	0.82
Financial Aid – Loans (logged)	3.71	0.19
Financial Aid – Merit (logged)	3.71	0.49
Financial Aid – Need (logged)	3.58	0.26

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Table 2 displays frequencies for all categorical variables used within this study for the overall weighted sample.

Among the overall sample, there were more females (54.5%) than males (45.4%). In terms of race/ethnicity, the majority of respondents were White (61%), followed by Hispanic (14%), Black (12%), Other (7.9%), and Asian (5.1%). The majority of respondents also fell within the middle SES category (58.2%), while 27.9% fell within the low SES category, and 13.9% fell within the high SES category. In relation to major field of study, most respondents had a STEM major (29.7%), followed by Humanities (21.9%), Other (19.6%), Business (15.7%) and Healthcare (13.1%). When considering academic integration, slightly more respondents reported utilizing academic support services (52.9%). Among the overall sample, a majority (96.7%) of respondents reported that they did not utilize an accommodation for a disability. It is important to note that the accommodation variable is only applicable to students who had already indicated having a disability, which may explain the large disparity in this percentage for the overall sample of students with and without disabilities.

Table 2

*Descriptive Statistics of Categorical Variables *Weighted – Overall Sample*

	(N = 7,909)
Variable	
Sex	
Female	54.5
Male	45.5
Race/Ethnicity	
White	61.0
Asian	5.1
Black	12.0
Hispanic	14.0
Other	7.9
SES	
Low SES	27.9
Middle SES	58.2
High SES	13.9
Major Field	
Humanities	21.9
STEM	29.7
Business	15.7
Healthcare	13.1
Other	19.6
Academic Integration	
No	47.1
Yes	52.9
Accommodation Use	
No	96.7
Yes	3.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Subsample 1

Subsample 1 served to answer research question 2 and included only students identifying as having a disability or special need, including but not limited to serious difficulty concentrating, remembering, or making decisions, learning disabilities, deafness, blindness, or Attention Deficit/Hyperactivity Disorder (ADHD). Subsample 1 included 1,938 individuals who indicated that they had a disability or special need, approximately 24.5% of the original sample.

Table 3 displays cross-tabulations, which compare characteristics between students with and without disabilities, including sex, race/ethnicity, SES, major field, academic integration, and accommodation use. Across the two groups, sex was fairly evenly distributed, with slightly more females than males within both groups. Specifically, among students with disabilities, 58.4% were female, whereas females represented 53.2% of students without disabilities.

In terms of race/ethnicity, the majority of students within both groups identified as White. Among students with disabilities, 62.4% were White, 4% were Asian, 10.6% were Black, 14.7% were Hispanic, and 8.3% were within the Other race/ethnicity category. Among students without disabilities, 50.5% were White, 5.4% were Asian, 12.5% were Black, 13.8% were Hispanic, and 7.7% were within the Other race/ethnicity category. A White majority is consistent with current U.S. population figures, as non-Hispanic or Latino Whites currently make up about 60% of the U.S. population. Rates among the other racial/ethnic groups were also consistent with the U.S. population, with the next largest population in the U.S. being Hispanic, followed by Black/African American, Asian, and Other (U.S. Census Bureau, 2021).

In terms of SES, there was also a fairly even distribution between those with and without disabilities. Specifically, among students with disabilities, 28.5% fell within the low SES category, 56.8% fell within the middle SES category, and 14.7% fell within the high SES category. Comparatively, among those without disabilities, 27.7% fell within the low SES category, 58.6% fell within the middle SES category, and 13.7% fell within the high SES category.

Similarities also existed among the major field category, with the largest discrepancy between students with and without disabilities being evident in the field of Humanities. Looking more closely at major fields, among students with disabilities, 28% were in a Humanities field,

28.7% in a STEM field, 11.8% in a Business field, 11.9% in a Healthcare field, and 19.5% in an Other field. Among students without disabilities, fewer students were in a Humanities field at 19.9%, and slightly more were in a STEM field at 30%.

When considering academic integration, more students with disabilities reported utilizing academic support services (65.6%) compared to those without disabilities (48.7%). Additionally, when reviewing accommodation use, it is important to consider that students without reported disabilities were not eligible to utilize accommodations. However, among students with disabilities, only 13.1% reported utilizing accommodations, compared to 86.9% who did not.

Table 3

*Characteristics of All Students with and without Disabilities *Weighted – Overall Sample*

Percentage	With Disability	Without Disability
Variable	**(N = 1,938)**	**(N = 5,971)**
Sex		
Female	58.4	53.2
Male	41.6	46.8
Race/Ethnicity		
White	62.4	60.5
Asian	4.0	5.4
Black	10.6	12.5
Hispanic	14.7	13.8
Other	8.3	7.7
SES		
Low SES	28.5	27.7
Middle SES	56.8	58.6
High SES	14.7	13.7
Major Field		
Humanities	28.0	19.9
STEM	28.7	30.0
Business	11.8	16.9
Healthcare	11.9	13.5
Other	19.5	19.7
Academic Integration		
No	34.4	51.3
Yes	65.6	48.7
Accommodation Use		
No	86.9	100.0
Yes	13.1	0.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Table 4 displays the means and standard deviations for all continuous variables within subsample 1 of full-time, degree-seeking students who were enrolled in or had already attained a degree from a 4-year public or private institution of higher education within the United States as of the second follow-up in 2016, including only students with disabilities. The mean for the social integration composite was 0.20, and the mean college GPA was 2.79. For the log-transformed financial aid variables, 3.72 was the mean for loans, 3.80 for merit-based aid, and 3.54 for need-based aid.

When comparing these measures of central tendency for subsample 1 of only students with disabilities to the overall sample, students with disabilities have a similar level of social integration but a slightly lower college GPA. Whereas the amount of financial aid-loans and financial aid-need is relatively similar across both groups, the amount of financial aid-merit is slightly higher for students with disabilities.

Table 4

*Descriptive Statistics of Continuous Variables *Weighted – Subsample 1*

(N = 1,938)

Variable	Mean	Standard Deviation
Social Integration	0.20	0.90
College GPA	2.79	0.82
Financial Aid – Loans (logged)	3.72	0.20
Financial Aid – Merit (logged)	3.80	0.43
Financial Aid – Need (logged)	3.54	0.24

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Subsample 2

Subsample 2 served to answer research question 3 and consisted of only students identifying as having a learning disability, not including ADHD. As data are not specifically differentiated amongst different types of learning disabilities, all students identifying as having any learning disability were included in subsample 2. Subsample 2 included 216 individuals who indicated that they had a specific learning disability, 2.7% of the original sample.

Table 5 displays the means and standard deviations for all continuous variables used for subsample 2 of full-time, degree-seeking students who were enrolled in or had already attained a degree from a 4-year public or private institution of higher education within the United States as of the second follow-up in 2016, including only students with learning disabilities. The mean for the social integration composite was 0.31, and the mean college GPA was 2.68. For the log-

transformed financial aid variables, 3.74 was the mean for loans, 3.80 for merit-based aid, and 3.52 for need-based aid.

When comparing these measures of central tendency for subsample 2 of only students with learning disabilities to the overall sample, and to subsample 1 of students with any disability, students with learning disabilities have a higher level of social integration than both other groups, but a lower college GPA. The amount of financial aid loans is slightly higher for students with learning disabilities compared to the other two groups. The amount of financial aid that is merit-based is the same for students with any disability and those with a learning disability, and both are higher than the overall sample. Financial aid that is needs-based is similar across all three samples.

Table 5
*Descriptive Statistics of Continuous Variables *Weighted – Subsample 2*

(N = 216)

Variable	Mean	Standard Deviation
Social Integration	0.31	0.87
College GPA	2.68	0.83
Financial Aid – Loans (logged)	3.74	0.19
Financial Aid – Merit (logged)	3.80	0.45
Financial Aid – Need (logged)	3.52	0.27

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Table 6 displays frequencies for characteristics for subsample 2 of students with learning disabilities. This includes all categorical variables within the study, such as sex, race/ethnicity, SES, major field, academic integration, and accommodation use.

Among students with learning disabilities, slightly more are male, 51.2% compared to 48.8% female. Similar to the overall sample, the majority of students with learning disabilities are White at 74.1%. Asian students comprise 1.9% of subsample 2, Black students 7.3%, Hispanic students 10.7%, and those of the Other race/ethnicity category 6%.

Also consistent with the overall sample, the majority of students with learning disabilities fall within the middle SES category at 58%. An additional 22.1% of students fall within the low SES category, and 19.9% of students fall within the high SES category. In terms of major field, students with learning disabilities are most represented in the Humanities field (29.9%). Among the remainder of the students, 22.4% were in STEM fields, 18.3% in Business fields, 7.2% in Healthcare fields, and 22.2% in some other field.

When considering academic integration, 66.5% of students with learning disabilities reported using academic support services. In terms of accommodation use, 41.8% of students with learning disabilities reported utilizing accommodations, compared to 58.2% who did not. This represents a large difference from the overall sample of students in which only 3.3% utilized accommodations, and subsample 1 of students with any disability, in which 13.1% utilized accommodations.

Table 6

*Characteristics of Students with Learning Disabilities *Weighted – Subsample 2*

Variable	% With Learning Disability (N = 216)
Sex	
Female	48.8
Male	51.2
Race/Ethnicity	
White	74.1
Asian	1.9
Black	7.3
Hispanic	10.7
Other	6.0
SES	
Low SES	22.1
Middle SES	58.0
High SES	19.9
Major Field	
Humanities	29.9
STEM	22.4
Business	18.3
Healthcare	7.2
Other	22.2
Academic Integration	
No	33.5
Yes	66.5
Accommodation Use	
No	58.2
Yes	41.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Lastly, a variance inflation factor (VIF) test was run to address any issues of multicollinearity. As there are several independent predictors in the models, it was important to ensure that variables are not highly correlated, which may impact the predictive nature of the regression analysis. VIF values of 10 or higher may indicate issues with multicollinearity. If such values are present in a VIF test, it is important to examine the highly correlated variables and remove them from the model. Table 7 outlines the VIF values for all of the independent

variables utilized in this study and demonstrates that the VIF values range from 1.00 to 4.20, indicating that none of the variables are highly correlated.

Table 7
Variance Inflation Factor (VIF) Values for Independent Variables

Variable	VIF
Background Characteristics	
Female	3.90
Asian	1.00
Black	4.20
Hispanic	2.48
Other Race	2.08
Middle SES	2.85
High SES	1.01
College Level Characteristics	
College GPA	3.29
Financial Aid – Loans (logged)	1.93
Financial Aid – Merit (logged)	1.00
Financial Aid – Need (logged)	2.22
STEM	1.62
Business	1.03
Healthcare	1.03
Other Major	2.23
Disability Status	1.00
Social Integration	2.04
Academic Integration	2.58
Accommodation Use	1.14

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Results of Inferential Analysis

Is the existence of any disability related to first-year retention?

To address research question 1, the overall sample was utilized to run a binary logistic regression, with retention as the dependent variable and disability as the predictor variable. Results of the logistic regression model used to address this question produce an odds ratio of 0.916 with a standard error of 0.001. This finding indicates that for students who identified as having a disability, the odds of being retained at their first institution is 8.4% lower than for

students who did not identify as having a disability. This difference is statistically significant ($p < 0.001$).

Controlling for other factors, are students with disabilities who utilize accommodations retained at a higher rate than those who do not utilize accommodations?

To address research question 2, subsample 1 including only students with disabilities was utilized. A binary logistic regression was run to examine the relationship between accommodation use and retention on students with disabilities. The model also included background characteristics, college-level characteristics, social integration, and academic integration factors outlined in Chapter III as controls. Background characteristics included sex, race/ethnicity, and SES. College-level characteristics included college GPA, financial aid, and major field. Table 8 outlines the odds ratio, significance level, and standard error for each of the variables included in the model. Significance levels lower than 0.001, 0.01, and 0.05 are reported.

Among this sample, there was no statistically significant difference in retention rate for students with disabilities who utilized accommodations versus those who did not utilize accommodations. However, there were some significant outcomes among other variables. In terms of background characteristics for students with disabilities, variables for sex, race and SES were significant. Specifically, female students with disabilities have 17% lower odds of being retained when compared to males with disabilities ($OR = 0.83$, $p < 0.01$). Among racial/ethnic groups, Black students with disabilities have 20% lower odds of being retained when compared to White students with disabilities ($OR = 0.80$, $p < 0.05$), and students with disabilities within the Other racial/ethnic category have 35% lower odds of being retained when compared to White students with disabilities ($OR = 0.65$, $p < 0.001$). In terms of SES, students with disabilities

from a middle SES have 33% lower odds of being retained when compared to those of a low SES (OR = 0.67, $p < 0.001$), whereas students with disabilities from a high SES have 52% higher odds of being retained when compared to those of a low SES (OR = 1.52, $p < 0.001$).

Among college-level characteristics, college GPA, financial aid and major field also had significant results. In terms of college GPA for students with disabilities, a one-point increase in GPA was related to a 150% increase in the odds of being retained (OR = 2.50, $p < 0.001$). In terms of financial aid, three significant results were found, where a one percent increase in financial aid (loans) was related to a 94% increase in the odds of being retained (OR = 1.94, $p < 0.05$), a one percent increase in financial aid (merit-based) was related to a 105% increase in the odds of being retained (OR = 2.05, $p < 0.001$), and a one percent increase in financial aid (needs-based) was related to a 262% increase in the odds of being retained (OR = 3.62, $p < 0.001$).

Within the major field category, two majors produced significant outcomes. Compared to students with disabilities within the Humanities field, students with disabilities within the Healthcare field had 23% lower odds of being retained (OR = 0.77, $p < 0.05$), and those within an Other major category had 20% lower odds of being retained (OR = 0.80, $p < 0.05$).

Lastly, a significant result was found for the academic integration variable. More specifically, students with disabilities who utilized academic support services had 52% higher odds of being retained when compared to students with disabilities who did not utilize these services (OR = 1.52, $p < 0.001$).

Table 8

Logistic Regression Analysis – Retention of Students with Disabilities

	Odds Ratio	Significance	Standard Error
Variable			**(N = 1,938)**
Background Characteristics			
Female	0.83	**	0.56
Asian	1.29		0.12
Black	0.80	*	0.09
Hispanic	1.01		0.10
Other Race	0.65	***	0.06
Middle SES	0.67	***	0.05
High SES	1.52	***	0.09
College Level Characteristics			
College GPA	2.50	***	0.05
Financial Aid – Loans (logged)	1.94	*	0.28
Financial Aid – Merit (logged)	2.05	***	0.16
Financial Aid – Need (logged)	3.62	***	0.27
STEM	0.88		0.07
Business	0.97		0.08
Healthcare	0.77	*	0.10
Other Major	0.80	*	0.08
Social Integration	1.05		0.03
Academic Integration	1.52	***	0.05
Accommodation Use	0.93		0.80

NOTE: Significance ***p <0.001; **p <0.01; *p <0.05

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Among students with specific learning disabilities, are those who utilize accommodations retained at a higher rate than those who do not utilize accommodations, controlling for other factors?

To address research question 3, subsample 2 including only students with learning disabilities was utilized. A binary logistic regression was run to examine the relationship between accommodation use and retention on students with learning disabilities. The model also included background characteristics, college-level characteristics, social integration, and academic integration factors outlined in Chapter III as controls. Background characteristics included sex, race/ethnicity, and SES. College-level characteristics included college GPA,

financial aid, and major field. Table 9 outlines the odds ratio, significance level, and standard error for each of the variables included in the model. Significance levels lower than 0.001, 0.01, and 0.05 are reported.

Among this sample, there was a statistically significant difference in retention rates for students with learning disabilities who utilized accommodations versus those who did not utilize accommodations, where students who utilized accommodations had 54% lower odds of being retained compared to students who did not utilize accommodations (OR = 0.46, $p < 0.01$).

Significant results were also found among other variables in the model. In terms of background characteristics for this subsample, students with learning disabilities within the Other racial/ethnic group had 85% lower odds of being retained when compared to White students with learning disabilities (OR = 0.15, $p < 0.001$). Additionally, students with learning disabilities within the High SES category had 201% higher odds of being retained when compared to students with learning disabilities within the Low SES category (OR = 3.01, $p < 0.001$).

Among college-level characteristics, significant results were evident for the college GPA, some financial aid, and major field variables. In terms of college GPA, for students with learning disabilities, a one-point increase in GPA was related to a 152% increase in the odds of being retained (OR = 2.52, $p < 0.001$). In terms of financial aid, a one percent increase in financial aid (needs-based) was related to an 842% increase in the odds of being retained (OR = 9.42, $p < 0.05$),

When examining major field, one major produced a significant outcome. Compared to students with learning disabilities within the Humanities field, students with learning disabilities within the Healthcare field had 90% higher odds of being retained (OR = 1.90, $p < 0.05$).

Lastly, a significant result was found for the social integration variable, where a one-point increase in feelings of social integration was related to a 44% increase in the odds of being retained (OR = 1.44, $p < 0.001$).

Table 9
Logistic Regression Analysis – Retention of Students with Learning Disabilities

Variable	Odds Ratio	Significance	Standard Error (N = 216)
Background Characteristics			
Female	0.95		0.17
Asian	1.87		0.44
Black	1.51		0.38
Hispanic	0.70		0.35
Other Race	0.15	***	0.32
Middle SES	0.98		0.27
High SES	3.01	***	0.31
College Level Characteristics			
College GPA	2.52	***	0.19
Financial Aid – Loans (logged)	4.71		1.08
Financial Aid – Merit (logged)	1.98		0.54
Financial Aid – Need (logged)	9.42	*	0.95
STEM	0.95		0.25
Business	0.61		0.32
Healthcare	1.90	*	0.26
Other Major	0.82		0.25
Social Integration	1.44	***	0.09
Academic Integration	1.14		0.19
Accommodation Use	0.46	**	0.22

NOTE: Significance ***p <0.001; **p <0.01; *p <0.05
SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Summary

This chapter discussed the descriptive and inferential analyses that were completed to address the three research questions within this study. The first section of this chapter outlined the descriptive analyses for the overall sample, subsample 1, and subsample 2. The remainder of the chapter presented the inferential analysis results that were utilized to address the research questions through binary logistic regressions. The first regression analysis revealed that students

with disabilities were less likely to be retained than students without disabilities. The second regression analysis revealed that accommodation use was not a significant predictor of retention among students with disabilities. However, significant results did exist for a number of background and college-level characteristics. The third regression analysis revealed that for students with learning disabilities, accommodation use was a significant but negative predictor of retention. Significant results also existed for a number of other background and college level characteristics within this subsample. The next chapter will discuss these findings in greater detail, as well as outline implications for policy and future research.

CHAPTER V

CONCLUSIONS

Summary of Findings

Within the United States, the number of students with disabilities entering higher education is greater than ever before. Furthermore, specific learning disabilities are the most commonly reported disabilities across all institutions of higher education, with numbers increasing year over year (Raue & Lewis, 2011; Troiano et al., 2010). Although increased legislation has been implemented to protect the rights of students with disabilities and prevent discriminatory practices, this population continues to lag behind comparable peers in terms of educational outcomes, including retention in higher education (Aron & Loprest, 2012). While individuals with disabilities are entering higher education at historically higher rates, retention from first to second year at the same institution and graduation rates, or earning a degree or certificate, for these individuals remain low compared to peers without disabilities. Empirical research surrounding this population also remains scarce, especially research focusing on retention (Herbert et al., 2014).

The purpose of this study was to examine the factors that predict first-year retention of students with disabilities at four-year public and private institutions of higher education in the United States. A specific focus was placed on students who self-identified as having specific learning disabilities, such as dyslexia, dysgraphia, or math disabilities, as these students are less likely to be retained than students identifying within any other disability group (Matesic, 2020). Additional attention was placed on the influence of accommodation use and the retention of these students.

In addressing these issues, this study seeks to add to the limited quantitative research available on the retention of students with disabilities and the impact of accommodation use in higher education. The findings of this study can also be utilized to inform university policy surrounding best practices in serving students with disabilities in higher education.

Utilizing data from the High School Longitudinal Study of 2009 (HSLS:09), this study sought to answer the following three research questions: (1) Is the existence of any disability related to first-year retention? (2) Controlling for other factors, are students with disabilities who utilize accommodations retained at a higher rate than those who do not utilize accommodations? (3) Among students with specific learning disabilities, are those who utilize accommodations retained at a higher rate than those who do not utilize accommodations, controlling for other factors? This chapter will discuss the results of the descriptive and inferential analysis.

Descriptive analyses revealed that when comparing the overall sample of students with and without disabilities, sex was fairly evenly distributed, with slightly more females than males within both groups. However, among students with learning disabilities, there were slightly more males than females. This is consistent with national trends, which show that males are more likely than females to be diagnosed with a learning disability (Zablotsky, 2019). In terms of race/ethnicity, the majority of students within the overall sample, subsample 1 and subsample 2, identified as White. Racial/ethnic demographics were consistent with the overall U.S. population (U.S. Census Bureau, 2019). The rate of disability was lowest for Asian students, and this rate was even lower for Asian students with learning disabilities. This finding is consistent with research that suggests that Asian students are underrepresented in terms of disability diagnosis; more so, Asian students are significantly less likely to be diagnosed with learning disabilities compared to White students (Maki et al., 2020; Shifrer et al., 2011). There was also a

fairly even distribution of SES between those with and without disabilities and learning disabilities, with the majority falling in the middle SES category. Again, this finding is consistent with the overall U.S. population (U.S. Census Bureau, 2019). When considering major fields of study, STEM fields were most reported among the overall sample, followed by Humanities fields. This division differed among students with disabilities, where these two fields were relatively evenly distributed, and among students with learning disabilities where a slightly higher percentage were in Humanities fields compared to STEM fields.

When considering college-level characteristics, students with learning disabilities had a lower college GPA than students with any disability, and both groups had a lower college GPA than the overall sample. For financial aid, students with learning disabilities received more financial aid loans than both students with any disability and the overall sample. Students with any disability and students with learning disabilities received a relatively equal amount of financial aid that was merit-based, which was higher than the overall sample. All three groups received a relatively equal amount of financial aid that was need-based.

In terms of integration factors, the overall sample and students with any disability demonstrated a fairly even amount of social integration, whereas students with learning disabilities demonstrated a higher level of social integration. In terms of academic integration, both students with any disability and students with learning disabilities demonstrated a higher likelihood of utilizing academic support services than the overall sample.

When considering accommodation use, 41.8% of students with learning disabilities reported utilizing accommodations, compared to 58.2% who did not. This finding represents a large difference from the overall sample of students in which only 3.3% utilized

accommodations, and subsample 1 of students with any disability, in which 13.1% utilized accommodations.

To address the three research questions, binary logistic regressions were run. For research question one, "is the existence of any disability related to first-year retention," results indicated that for students who identified as having a disability, the odds of being retained at their first institution is 8.4% lower than for students who did not identify as having a disability. This difference is statistically significant ($p < 0.001$).

For research question two, "controlling for other factors, are students with disabilities who utilize accommodations retained at a higher rate than those who do not utilize accommodations?" results indicated no statistically significant difference in retention rate for students with disabilities who utilized accommodations versus those who did not utilize accommodations. However, there were some significant outcomes among other variables. In terms of background characteristics for students with disabilities, sex, race/ethnicity, and SES had significant predictors. Specifically, females with disabilities were less likely to be retained than males. This finding is contrary to existing literature by Mamiseishvili and Koch (2011) and Pingry O'Neill et al. (2012), who found that females with disabilities have higher odds of retention than males. However, it is consistent with a finding by St. John et al. (2001), who found that males were more likely to be retained when holding constant background variables.

Additionally, Black students and students within the Other racial/ethnic category who had disabilities were less likely to be retained than White students with disabilities. This is consistent with literature that suggests that students of color with disabilities had lower likelihoods of persistence during their first and second year when compared to their White counterparts (Koch et al., 2018).

For students with disabilities, SES and retention were not linearly related. Specifically, students in the middle SES category were less likely to be retained when compared to those of low SES, whereas students of high SES were more likely to be retained. This finding for high SES students was consistent with national trends, which suggest that students of a higher SES are more likely to persist into their second year (Chen & St. John, 2011; Olbrecht et al., 2016). The differences in outcomes between middle SES and high SES may be explained by other factors, such as financial aid, which may be need-based. For instance, students of a low SES may receive greater amounts of need-based financial aid than those of a middle SES, and this factor may have a greater impact on retention than SES alone.

When considering college-level characteristics, college GPA, financial aid, and major field were also significant predictors of retention. In terms of college GPA for students with disabilities, each one-point increase in GPA was related to an increase in the odds of being retained. This finding supports previous research, which has consistently found a positive and significant relationship between college GPA and first to second year retention among students with disabilities (Herbert et al., 2014; Mamiseishvili & Koch, 2011).

Students with disabilities with greater financial aid in terms of loans, merit-based aid, and need-based aid all had increased odds of retention. This finding supports existing research by Stewart et al. (2015), who found that students who were awarded financial aid were significantly more likely to persist than students who did not receive financial aid. In terms of major field, students with disabilities within the Healthcare and Other major field of study both had lower odds of retention when compared to those within the Humanities field. This finding is consistent with existing research, which has found that students in engineering, biological and biomedical

sciences, and humanities majors are more likely to be retained than those in other majors (National Student Clearinghouse, 2019).

Lastly, a significant result was found for the academic integration variable. More specifically, students with disabilities who utilized academic support services had higher odds of being retained when compared to students who did not utilize these services. This finding supports research by Mamiseishvili and Koch (2011), which found a significant relationship between the use of academic supports, social interaction with faculty, meetings with advisors and persistence, as well as research by Koch et al. (2014), which found a significant association between how often first-year students meet with their academic advisor and first-to-second year persistence rates.

For research question three, "Among students with specific learning disabilities, are those who utilize accommodations retained at a higher rate than those who do not utilize accommodations, controlling for other factors?" results indicated a statistically significant difference in retention rates for students with learning disabilities who utilized accommodations versus those who did not utilize accommodations. Specifically, among students with learning disabilities, those who utilized accommodations had 54% lower odds of being retained than those who did not. This finding was significant at the $p < 0.01$ level. This finding supports the mixed outcomes that are evident in the existing literature. While Newman et al. (2020) found that students who accessed universally available supports (e.g., tutoring, writing centers available to the entire student body) were more likely to persist, there was no significant relationship for students who received only disability-related services. As the specific type of accommodations used are not specified in the data, it is difficult to assess whether they were universally available or specific to the learning disability. It is also important to consider that the sample size of

students with learning disabilities (N = 216) is very small and may help to explain the reliability of the negative result of the use of accommodations on retention for this group.

In addition to accommodation use, several other variables produced significant results in terms of retention. Students within the Other racial/ethnic category who had learning disabilities were less likely to be retained than White students with learning disabilities. As mentioned, this finding is consistent with previous literature, which suggests that minority students have lower likelihoods of retention (McClain & Perry, 2017). Students with learning disabilities of high SES were more likely to be retained than those of low SES. Again, this finding was consistent with national trends, which suggest that students of a higher SES are more likely to persist into their second year (Chen & St. John, 2011; Olbrecht et al., 2016).

When considering college-level characteristics, college GPA, financial aid, and major field were also significant predictors of retention. In terms of college GPA for students with learning disabilities, each one-point increase in GPA was related to an increase in the odds of being retained. This finding supports previous research, which has consistently found a positive and significant relationship between college GPA and first to second year retention among students with disabilities (Herbert et al., 2014; Mamiseishvili & Koch, 2011). Students with learning disabilities with greater needs-based financial aid had increased odds of retention. This finding is consistent with a study by Chen and DesJardins (2010) that found a positive and significant effect of need-based aid on retention.

In terms of major field, students with learning disabilities within the Healthcare field had higher odds of being retained when compared to those in the Humanities field. This finding may be due to many colleges implementing more selective admissions standards for their healthcare programs in an effort to address historically high attrition rates in these programs (Donnell,

2015; Jeffreys, 2012). Selective admissions processes may include requiring a higher GPA, more stringent interview processes, prerequisite courses, and recommendations (Cortes, 2013; DiBartolomeo, 2018). Therefore, students within these fields, even those with learning disabilities, may already be strong academic candidates and more likely to be retained.

Lastly, a significant result was found for the social integration variable. Students with learning disabilities who demonstrated a higher degree of social integration had higher odds of being retained. This finding is consistent with past research, which indicates that social integration is a major predictor of retention for students with disabilities (DaDeppo, 2009; Mamiseishvili & Koch, 2011).

When reviewing the findings across students with any disability and those with learning disabilities, consistencies are found across several variables. Among both groups, those of the Other racial/ethnic group were less likely to be retained, whereas those within the high SES category, those with a higher GPA, and those who receive greater needs-based financial aid were all more likely to be retained. One inconsistency was present among the two groups of students, where students with disabilities within the Healthcare field were less likely to be retained, whereas students with learning disabilities within the Healthcare field were more likely to be retained. This mixed finding confirms discrepancies seen within the existing literature. Moreover, the literature surrounding college major often incorporates other factors into the analysis. Therefore, major alone has not been widely found to be a predictor of retention in higher education when not examining one specific field or other factors that may impact retention in combination with major field (John et al., 2004). Such a discrepancy may be explained by other factors not included in this study, such as taking a foundational level or

gateway course in a declared major, which Flanders (2017) has found to show higher retention rates among first-year college students.

Other college-wide supports, apart from accommodation use and gateway courses, may also be valuable for student outcomes such as retention. The utilization of counseling services and tutoring centers has been found to be beneficial to students with disabilities (Thompson-Ebanks, 2014). Tutoring centers may assist with vital study skills, such as organization, time management, notetaking, and test-taking strategies. The utilization of learning specialists for content-specific areas such as reading, writing, and math at learning assistance centers has also been beneficial to students with disabilities, especially to help remediate deficits with the specific area of learning disability (Higbee & Eaton, 2008; Opitz & Block, 2008).

Implications for University Policy and Practice

The results of this study have implications for university policy and practice, as it is important for institutions to continue to review their practices as they relate to students with disabilities. This study confirmed that students with disabilities are less likely to be retained from their first to their second year when compared to students without disabilities. As retention has already been linked to improved outcomes later in life, it is vital to understand why students with disabilities are not retained at the same rate as their peers and implement strategies to help support these students.

Additionally, this study revealed that while there was no significant relationship between accommodation use and retention for students with any disability, there was a significant but negative relationship between accommodation use and retention for students with learning disabilities. This finding demonstrates that factors apart from accommodation use alone may be critical in determining retention of students with disabilities and learning disabilities and that

additional research is warranted to examine those factors more closely. For instance, it is possible that the accommodation use reported by these students was more geared toward social support rather than academic support and that the specific type of support services received may be more or less related to retention.

Regardless, based on the significant factors that were found and the need for a better understanding of accommodation use, this study seeks to provide guidance for policy and future research. In terms of overall retention of students with disabilities, several strategies for improvement have been identified across institutions, including spreading awareness and knowledge regarding disability needs and services, creating a barrier-free and welcoming campus through shared norms, and professional development for faculty (Getzel, 2008; Hansen & Dawson, 2020; Leake & Stodden, 2014; Mamiseishvili & Koch, 2011; Wessel et al., 2009).

Spreading Awareness about Support Services

As self-awareness and self-determination have been recognized as necessary for academic achievement and persistence for students with disabilities (Getzel, 2008; Kutscher & Tuckwiller, 2018), institutions of higher education are finding themselves having to commit more time and effort into spreading awareness and knowledge both of disabilities and services that are offered at their institutions.

As it relates to accommodation use in this study, only a small percentage of those with disabilities utilized accommodations, and slightly more students with learning disabilities utilized accommodations. At the secondary level, research has indicated that participation in transition planning in high school and the inclusion of postsecondary accommodations needed after high school in a transition plan increase the likelihood of a student disclosing their disability to a higher education institution and receiving both general and disability-specific

accommodations, both of which have been associated with higher retention rates (Newman et al., 2016).

An integral part of transition planning includes the creation of a Summary of Performance (SOP), which secondary schools are required to complete for students with disabilities under IDEA (Southward & Davis, 2020). An SOP outlines the student's strengths, interests, needs, and postsecondary goals. It also offers recommendations to assist the student with meeting their postsecondary goals by outlining essential accommodations, including assistive technology/adaptive devices and supportive services. Research has suggested that disability service providers, especially at institutions of higher education, rate SOPs as very useful when determining appropriate accommodations and supportive services for students with disabilities (de Vries & Schmitt, 2013). The most effective SOPs are those that include input from the student and, at times, their parent regarding strengths, interests, needs, and goals (Mazzotti et al., 2015). For students with disabilities, parents are oftentimes highly involved in the decision-making process and can help to guide students and set expectations for postsecondary education. It is therefore imperative for high school staff to include students with disabilities, along with their parents, in transition planning, including in the creation of an SOP.

At the postsecondary institutional level, it is important to examine policy more closely that relates to disability disclosure and accommodation use. Specifically, the availability of information relating to disability support services and how to request these services is important to disseminate early on in the admissions process. Partnerships between admissions offices and the offices of disability support services are critical in ensuring that accurate information regarding support services and accommodations is shared with all incoming students and their parents, such as during open houses or freshman orientation.

One intervention that has been shown to assist students in overcoming these obstacles is the dissemination of information even before a student is admitted to a university (Wessel et al., 2009; Mamiseishvili & Koch, 2011). Through the use of brochures, websites, and other promotional materials, students were made aware of offices, services, and accommodations that were offered at one public, four-year, Carnegie doctoral-granting institution in the Midwest. As a universal outreach, all newly admitted students were also provided with self-disclosure for disability forms and encouraged to complete these forms and make arrangements with the Office of Disability Support Services. Spreading such information to all students assisted those in need by not only giving them the information directly but also encouraging them to seek out supports, such as tutoring, writing center appointments, and meetings with academic advisors.

Other methods that have been successful in making students aware of available supports before they encounter difficulty include sharing information at first-year experience programs, first-year seminar courses, academic advising meetings, and residence hall meetings (Wessel et al., 2009). Outreach to provide awareness regarding academic support services may also be beneficial for these students to help promote more engagement.

Furthermore, this study found that students with learning disabilities who utilized accommodations were less likely to be retained than those who did not. This is an important finding for university policy and practice, as existing research has shown that while students who accessed universally available supports (e.g., tutoring, writing centers available to the entire student body) were more likely to persist, there was no significant relationship for students who received only disability-related services (Dong & Lucas, 2016). Such a finding indicates that the use of accommodations and services alone is not enough to impact retention but that it is important to analyze the effectiveness of specific supports utilized. For instance, Lichiello

(2012) found that due to limitations associated with funding and staffing, many institutions of higher education are limited in the types of accommodations that they can provide. It is therefore important for institutional reviewers to examine the operations of their offices of disability support services to determine and remediate any limitations that may impact the availability of accommodations. It is also important for institutions to more closely study the effectiveness of various types of accommodations that have been related to better student outcomes, such as course substitutions or waivers, readers, classroom note-takers, physical therapy, alternate format or distraction-free testing, flexible due dates, scribes, and instruction on learning strategies (Mamiseishvili & Koch, 2011; Pingry O'Neill, 2012).

One of the other significant findings of this study is that college GPA is related to higher rates of retention. Therefore, it is important for institutions to review any factors that may impact college GPA and offer strategies to help improve college GPA, especially for first-year students. For instance, Troiano et al. (2010) found that students who attended appointments at academic support centers and worked with learning or writing specialists had higher rates of persistence and higher GPAs than those who did not attend or attended inconsistently. Therefore, encouragement from faculty and academic advisors to make regular appointments at academic support centers on campus is recommended.

In a review of predictors of academic success in college students with learning disabilities, Stevens et al. (2021) found that several factors relating to academic regulation and academic self-efficacy have been linked to higher GPA and thus retention. For instance, procrastination and avoidant behaviors were linked to lower GPA (Murray & Wren, 2003), whereas optimism (Shmuksly & Gobbo, 2007), greater use of metacognitive reading strategies and study aids (Chevalier et al., 2017), conceptual skills (Ruban et al., 2003), and emotional

intelligence (Zysberg & Kasler, 2017) were all linked to higher GPA in students with learning disabilities. Therefore, explicit instruction in study skills, self-monitoring, academic self-efficacy, and emotional regulation are important considerations for academic support centers working with these students.

Another finding of this study is that among students with disabilities, higher SES was also linked to higher odds of retention. While existing research suggests that students of lower SES tend to have higher debt burdens and lower salaries after graduation (Chen &Wiederspan, 2014), students with disabilities face additional challenges and may require extra levels of financial support and training in job skills to acquire higher-paying jobs after graduation. For these students, institutions may help to disseminate information regarding existing organizations that provide financial support for students with disabilities. For instance, while disseminating information regarding support services on campus, institutions may also share information regarding the National Federation for the Blind, the Cystic Fibrosis Scholarship Foundation, or the Billy Barty Foundation, all of which provide financial support through grants or scholarships (CollegeScholarships.org).

Providing information regarding broader sources of financial support and career services, such as the state's Division of Vocational Rehabilitation Services or the TRIO program, a federally sponsored outreach program that specifically provides academic, pre-employment, job coaching, and financial support to students from disadvantaged backgrounds, such as low SES or disabled students, would also be critical (U.S. Department of Education, 2021).

Institutions may also examine methods of providing greater institutionally based financial support, such as financial aid that is not need- or merit-based. For instance, some institutions sponsor grants or scholarships for students from underrepresented populations, such as those

with disabilities. The University of Illinois at Urbana-Champion, Wayne State University, and Landmark College are just some of the institutions providing disability-specific financial assistance. Sharing such information and advancing financial efforts to support disadvantaged students helps to create an environment of inclusion and acceptance and encourages another area of general improvement: creating barrier-free and welcoming campuses through shared norms.

Creating Barrier-Free and Welcoming Campuses

To create barrier-free and welcoming campuses, administrators, faculty, staff, and students must first be willing to examine the climate of their campus and shift from a climate of judgement to one of inclusion. Although special education legislation has helped to ensure that students with disabilities receive equal treatment, these same laws have created cultures based on the medical model of disability status, where students are classified as either disabled or non-disabled (Leake & Stodden, 2014). Creating an inclusive environment means shifting our language away from a focus on disability and moving towards personal characteristics and strengths. Institutions of higher education can create more welcoming campuses by using phrases such as “neurodiverse” rather than “disabled.”

Creating barrier-free environments also means that there is a greater need for interdepartmental collaboration. Student support services cannot be seen as isolated departments for those who are different but rather as integrated parts of a whole system. Such an inclusive social model has been adopted by the University of Connecticut, in which members of their Disability Support Services department all serve as interdepartmental liaisons. These individuals help to create collaborative relationships with individuals across their campus by spreading knowledge through workshops on disability-related topics (Leake & Stodden, 2014). Rather than operating in a remote location, this department is more visible within the campus community,

spreading the message that departments must work collaboratively to create an inclusive environment for all students.

Creating welcoming campuses also means actively countering stigma or perceived stigma to encourage greater levels of self-disclosure. Cole and Cawthon (2015) identified the use of a syllabus statement or verbal statement during class, welcoming students to discuss their disability and needed accommodations as a strategy that has positively impacted students' willingness to self-disclose a disability and request needed supports.

Providing Professional Development for Faculty

Spreading knowledge about disabilities is just as important for faculty as it is for students. In a study regarding faculty preparedness for teaching students with learning disabilities, Hansen & Dawson (2019) found that college faculty were underprepared for teaching students with learning disabilities. Faculty generally demonstrated misconceptions about students with learning disabilities, such as thinking they are less intelligent, lacking effort, or only needing more time on tests. Regardless, faculty demonstrated a willingness to work with these students and to develop their own knowledge base. Faculty indicated that knowledge could be increased through communication with disability support offices.

Professional development opportunities for faculty are a promising way to spread awareness regarding various disabilities and best teaching practices to foster relationships with students with disabilities. For instance, the Disabilities, Opportunities, Internetworking, and Technology (DO-IT) program through the University of Washington has been successful in providing educators with information and professional development opportunities regarding tools, services, and other resources to assist them in working with students with disabilities (University of Washington, 2018).

One of the most promising instructional strategies for creating accessible learning environments and materials for students is the universal design for instruction method (Getzel, 2008). This design is one of the specific methods covered by the DO-IT program. Universal design of instruction has been found to be effective in instructing students with disabilities by teaching faculty strategies to create flexible materials, utilize new technologies, and vary instructional methods within the classroom. Such efforts have been funded by the U.S. Department of Education at various secondary and postsecondary institutions and have been found to be helpful when incorporated into professional development activities aimed at disseminating information regarding diverse learners, including those with disabilities (Getzel et al., 2003).

In addition to the public level funding, private institutions, such as Seton Hall University, have found value in universal design of instruction and have made investments in emerging accessibility tools such as Blackboard Ally. Blackboard Ally is an add-on tool that allows instructors to convert their course materials into alternative formats, such as accessible PDF, HTML, audio, ePub, and electronic braille (Seton Hall University, 2018). Such a tool creates flexibility and assists instructors in better meeting the needs of their students. By working more closely with their faculty and staff, institutions can help to support the academic integration of students with disabilities.

In addition to the various tools and strategies that can be implemented, the relationships that both academic advisors and faculty members establish with students with disabilities are critical to their success. Research has consistently found that frequent meetings with academic advisors is related to persistence (Koch et al., 2014). Additional support and academic guidance

at the higher education level, particularly through meetings with academic advisors, for students who are undecided, may also be beneficial.

Faculty relationships, including mentorship opportunities, have also been found to be important components to students' support systems, improving their self-advocacy skills and persistence (Orr & Goodman, 2010; Timmerman & Mulvihill, 2015). Orr and Goodman (2010) suggested that faculty should be willing to meet with students, provide accommodations, and be involved with campus organizations. Such involvement by faculty provides both an academically and socially supportive environment, increasing the likelihood of student engagement and retention.

Future Research

This study intends to fill gaps in current research by further examining factors that predict first to second year retention of students with disabilities in higher education, specifically for those with learning disabilities. It also seeks to explore the relationship between accommodation use and retention. However, even with the advances made by the DDDM, it still lacks a clear framework to connect any population of students with disabilities to the outcome of student retention. While this study proposes a conceptual model incorporating background characteristics, college-level characteristics, academic and social integration, as well as accommodation use in the study of student retention, it will be important to further explore this model or expand an existing theory. Other factors, such as individual resiliency/motivation and disability type, may also be included as important factors to consider when examining retention.

In terms of the factors that were included in this study, it is important to examine a few relationships more closely. For instance, for students with disabilities, SES was not linearly related to retention. Whereas students in the middle SES category were less likely to be retained

when compared to those of low SES, students of high SES were more likely to be retained. The differences in outcomes between middle SES and high SES may be explained by other factors, such as financial aid, which may be need-based. For instance, students of a low SES may receive greater amounts of need-based financial aid than those of a middle SES, and this factor may have a greater impact on retention than SES alone. It is therefore important that future research test this possibility by examining the interaction effect between SES and financial aid.

It is also important that future research be completed to help understand the nuanced differences in outcomes for students with different types of disabilities. This difference is especially true when comparing apparent versus non-apparent disabilities, as the social and academic integration components for these students may be different. As the sample size of students with learning disabilities for this sample was small, less than three percent of the overall sample, it will also be important to study these students more closely, preferably with a larger sample, such that results can be more readily generalizable to the overall population.

In addition to a larger sample size, it will be important for future researchers to collect more updated data regarding the retention of students with disabilities. Due to the longitudinal nature of the HSLS:09, more recent data is not available, as students from more recent high school cohorts have not had the opportunity to be surveyed regarding postsecondary experiences several years after high school graduation. At this time, the HSLS:09 provides the most recent existing longitudinal data that track high school students into college. The absence of more regularly updated data regarding the retention of students with disabilities hinders research and constitutes a limitation of this study.

Future data collection may be done on a national scale through continued longitudinal studies by the National Center for Education Statistics. Examining base-year cohorts beyond the

initial 2009 phase will be critical for continued study. Additionally, data collection may be completed on a smaller, more localized level. To better understand retention rates among their students, institutional review boards may collect targeted data regarding their students, specifically those with disabilities, their accommodation use, and their outcomes in terms of retention. While this information may be especially useful for the institution's specific student outcomes and could be collected on a more frequent basis, it will be difficult to generalize.

Additionally, future research may seek to review accommodations more closely. For instance, while research has generally demonstrated the importance of disability disclosure and accommodation use, it is also important to further explore other factors related to accommodation use, such as quality of accommodations and match between need and specific accommodation utilized. While qualitative studies have demonstrated the importance of accommodation quality (Finn, 1998; Greenbaum et al., 1995; McCleary-Jones, 2008) and match (Finn, 1998; Greenbaum et al., 2995; Hong, 2015; Skinner, 2004; Timmerman & Mulvihill, 2015), no quantitative research exists that explores these factors.

Given that students with disabilities who utilized academic support services had higher odds of being retained when compared to students who did not utilize these services, it will be important to further examine the specific academic supports that are the most effective for these students. While existing research has found a significant relationship between the frequency of meetings with academic advisors and retention (Koch et al., 2014), there may be specific aspects of academic advising or additional academic integration factors, such as tutoring or working with learning specialists, which may be related to retention.

Lastly, given the increase of students with disabilities on college campuses, it will also be important to consider institutional level factors such as type (two- vs four-year), size, control,

and selectivity to better understand if these characteristics have a significant impact on retention rates for students with disabilities. Several areas of improvement have been identified for institutional practice, including spreading awareness and knowledge regarding disability needs and services, creating a barrier-free and welcoming campus through shared norms, and professional development for faculty (Getzel, 2008; Wessel et al., 2009; Mamiseishvili & Koch, 2011; Leake & Stodden, 2014). Accordingly, it is important to further explore the factors that impact retention of students with disabilities, but also to put into place policies and practices aimed at reducing potential barriers and increasing access to any facilitating factors.

Summary

This chapter began with a summary of the findings of this study, which sought to examine the factors which influence the retention of students with disabilities in higher education. Based upon the findings, implications for university policy and practice were also discussed, including spreading awareness about support services, creating barrier-free and welcoming campuses, and providing professional development for faculty. Such implications are relevant at both the student and institutional levels.

At the student level, there is a need for more involvement and self-advocacy in terms of participation in transition planning at the postsecondary level. This extends to the need to disclose disabilities and request support services at the postsecondary level. At the institutional level, there is a greater need to spread awareness about disabilities and best teaching practices to faculty. Additional work also needs to be done to spread awareness about support services to incoming students. At both levels, greater levels of understanding regarding disabilities are needed in order to encourage more welcoming campuses that limit barriers to student success.

This study contributes to the field of higher education by outlining specific factors that are related to retention for students with disabilities overall and more specifically for those with learning disabilities. Such factors have been closely examined, and recommendations have been made regarding ways to improve retention rates based on these factors. However, additional research is needed in some areas to gain a more in-depth understanding of students with disabilities in higher education and ways in which to support their retention.

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SETON HALL UNIVERSITY
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July 23, 2021

Donna Stanic
Seton Hall University

Re: 2022-246

Dear Ms. Stanic,

The IRB is in receipt of the application for your study entitled "*How important are accomodations? Examining the retention of students with specific learning disabilities in higher education*." After reviewing the inclusive content, the proposed study was deemed to be "Not Human Subjects Research" by the Research Ethics Committee of the Seton Hall University Institutional Review Board and is therefore beyond the purview of the Institutional Review Board. Therefore, you are under no obligation to submit any further correspondence to the Seton Hall University Institutional Review Board regarding this effort, unless of course there are any modifications made to the design or intent of your study that may otherwise change the designation to human subject's research. If you plan to create any future correspondence with the Institutional Review Board about this study, please reference the ID# listed above.

Sincerely,

Director, Institutional Review Board
Seton Hall University