ABSTRACT

Title of Dissertation: EXAMINING THE PLANS OF YOUTH WITH
                                          DISABILITIES TO ENROLL IN A 2- OR 4-
                                          YEAR COLLEGE OR UNIVERSITY

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The purpose of this study was to explore the differences between youth with

disabilities plans to attend a 2- or 4-year college and to compare them to their peers

without disabilities who also plan to attend a 2- or 4-year college or university. A second

purpose was to identify the relative contribution of selected family, student, academic,

and school contextual factors in predicting a student's plans in 12th grade to attend a 2- or

4-year college or university. Variables related to family, student, academic, and school

characteristics were identified from the first and second waves of the Education

Longitudinal Study of 2002 database. Chi-squares, t-tests, and HGLM analysis were used

in this study.

The results of the study showed that having an IEP was negatively related to a

youth's plans to attend a 2- or 4-year college or university. However, taking advanced

math coursework and being in a college preparatory track reduced the impact of having

an IEP on a youth's educational plans. Although, on average, youth with disabilities did not take the same level of advanced math coursework as did their peers without disabilities who also planned to attend a college or university. Further, GPA had less an impact on the plans of a youth with disabilities to attend a 2- or 4-year college or university than it did on youth without disabilities. Finally, the results demonstrated that educational aspirations of youth with disabilities remained stable between 10th and 12th grades.

The findings emphasize the importance of providing youth with disabilities access to a general education curriculum and a course of study that will allow them to be prepared for a 2 or 4 year college. The findings regarding aspirations also indicate that developing transition goals and a course of study prior to entering high school will provide opportunities for youth with disabilities who aspire to attend higher education to take the necessary coursework.

Examining the Plans of Youth with Disabilities to Enroll in a
2- or 4-year College or University

By

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DEDICATION

To my parents, Richard and Helen Hoffman, your belief and support in my abilities enabled me to persist through any obstacle.

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LIST OF ABBREVIATIONS

ACT: American College Test
ADA: Americans with Disabilities Act
CATI: Computer-Assisted Telephone Interview
CCD: Common Core of Data
EHA: Education of the Handicapped Act
ELS:02: Education longitudinal Study of 2002
ESEA:94: Elementary and Secondary Education Act
FAPE: Free and Appropriate Public Education
FARMS: Percent Free and Reduced Lunch
GED: General Education Development
GPA: Grade Point Average
GSS: General Social Survey
HGLM: Hierarchal General Linear Modeling
HLM: Hierarchal Linear Modeling
HS&B: High School and Beyond
IDEA: Individuals with Disabilities Education Act
IEP: Individualized Education Program
LD: Learning Disability
LEP: Limited English Proficiency
LRE: Least Restrictive Environment
NCD: National Council on Disabilities
NCES: National Center for Educational Statistics
NCLB: No Child Left Behind
NCTM: National Council for Teaching Mathematics
NELS:88: National Educational Longitudinal Study of 1988
NLS-72: National Longitudinal Study of 1972
NLTS: National Longitudinal Transition Study
NLTS2: National Longitudinal Transition Study 2
NPSQ: New Participant Survey Questionnaire
OSERS: Office of Special Education and Rehabilitation Services
PD: Psychological Disability
PPS: Probability Proportional Size
PSD: Physical/Sensory Disability
PSS: Private School Survey
R: Standardized Residuals
Section 504: Section 504 of the Rehabilitation Act of 1973
SPSS: Statistical Package for the Social Sciences

CHAPTER I

Introduction

Over the past three decades, individuals with disabilities have been increasing their participation in higher education. In 1987, a nationally representative longitudinal follow-up study of special education youth reported that 15% of those youth were enrolled in some type of postsecondary institution. However, only 4% had ever enrolled in a 2-year college and only 1% had ever enrolled in a 4-year college or university (Wagner, Newman, Cameto, & Levine, 2005). A second follow-up study on a similar sample of adolescents with disabilities that was conducted in 2005 found that 21% of the youth with disabilities who had received special education had at some point enrolled in a 2-year college and 10% had enrolled in a 4-year college or university within two years of leaving high school (Wagner, et al.).

Despite the increase in enrollment, when compared to the general population, the percent of youth who have received special education and who enroll in a 2- or 4-year college or university, and remain enrolled, is small. According to Wagner et al. (2005), 10% of all youth with Individualized Education Programs (IEPs) were attending a 2-year college in 2005, as compared to 12 % of the general education population, and only 6% of all youth with IEPs were attending a 4-year college or university, as compared to 28% of the general education population.

A major goal of special education policy has been to improve the postschool outcomes among youth with disabilities, including attending college. The transition provisions of PL 108-446, the Individuals with Disabilities Education Improvement Act amendments of 2004 (IDEA) have a particular focus on helping secondary students with

disabilities plan for post-secondary education. There are also two other laws that support access of students with disabilities to college and universities: PL 93-112 , Section 504 of the 1973 Vocational Rehabilitation Act (Section 504); and PL 101-336, the Americans with Disabilities Act (ADA), specifically Title III. Before discussing what we know and do not know about how to increase the enrollment of students with disabilities in 2- or 4-year colleges and universities, it is important to review these three laws.

Federal Policies Supporting College Attendance

As noted above, three major federal laws support youth with disabilities who wish to enroll in colleges or universities. These are the IDEA, Section 504 and the ADA.

Individuals with Disabilities Education Improvement Act

The IDEA is the special education legislation that guarantees children and youth ages 3-22 with disabilities access to a Free and Appropriate Public Education (FAPE). The original law, the Education for All Handicapped Act of 1975 (P.L. 94-142), which was renamed in the 1990 reauthorization, guaranteed youth with disabilities protection from discrimination by providing access to an appropriate publicly funded education. Under the IDEA, youth with disabilities have six fundamental rights: zero-exclusion policy; FAPE; non-discriminatory and multidisciplinary assessments, procedural safeguards; an Individualized Education Program (IEP); and education in the Least Restrictive Environment (LRE; Hardman, Drew, & Egan, 2005). Upon graduating or exiting public school with a certificate or dropping out, the student with a disability is no longer protected by IDEA; rather the student may then be eligible for protection under Section 504 and the ADA which are discussed later in this section.

As defined in the IDEA, special education means specially designed instruction, provided at no cost to parents, to meet the unique needs of a child with a disability (20 U.S.C. 1400 § 602 (29)). Each student eligible to receive special education must have an Individual Education Program (IEP) that specifies annual goals and the specific supports and services, including related services, the student will receive in order to progress toward the goals. One of the long term goals of special education has been to improve postschool outcomes among youth with disabilities. These outcomes include employment, independent living, and attending post-secondary education. Concerns about the lack of postsecondary success among youth who exited special education prompted the addition of transition services as part of the IEP requirements in the 1990 reauthorization of IDEA. Transition services, as defined in the IDEA, are a set of activities designed to promote the movement from school to postsecondary education, independent living, and/or employment (20 U.S.C. § 1400). These activities and services are intended to coordinate the supports and services a student receives during secondary school with postsecondary services in order to help the student make a successful transition from public school and achieve their postschool goals. The IDEA requires that all youth with disabilities being served under IDEA have a statement of transition goals and services in place starting on their 16th birthdays. The transition services must: (a) must be based on an assessment of the student's postsecondary goals, (b) must be developed with interagency collaboration to ensure a smooth and successful transition, (c) must specify activities in secondary school that are designed to help a student reach a particular transition goal; and finally, and (d) must involve the student as an active member of the transition planning process (Neubert, 2006).

In the 2004 IDEA amendments, the transition requirements were revised to specify that a student's postsecondary goals be results-oriented and focus on a student's strengths. The definition of transition services was also expanded to include postsecondary education. For youth who aspire to enroll in a 2- or 4-year college or university, transition services might include identifying the disability support services on campus, as well as making contact with school representatives to understand the services available on the college campus for youth that have been identified as having a disability under Section 504 and ADA definition. In addition, as part of the transition planning process, students develop an appropriate course of study to meet their postsecondary goals, such as a college preparatory curriculum for students who wish to gain admission to a 2- or 4-year college or university.

Access to the General Education Curriculum

In addition to transition requirements, the 1997 amendments to the IDEA required that a student's IEP state how he/she would access and progress in the general education curriculum. This change in the law focused, for the first time, on ensuring that all students with disabilities have an opportunity to take courses and learn the same important content as their typical peers. The law required IEP teams to determine goals for the student that would consider or be based on the general education curriculum. In addition, IEP teams must determine what supports, services and accommodations a student requires to access the curriculum.

The 2001 Elementary and Secondary Education Act amendments (No Child Left Behind Act; NCLB) further emphasized the need for students with disabilities to fully participate in general education assessments and content standards. The NCLB furthered

the movement toward universal and rigorous curriculum which began with the development of national standards such as those developed by the National Council of Teachers on Mathematics (NCTM) (n.d.). Finally, the most recent amendments to the IDEA place even greater emphasis on ensuring that students with disabilities access subject matter content. Collectively, these new provisions in both general and special education laws have raised expectations for students with disabilities and promote unprecedented opportunity for these students to expand their knowledge (McLaughlin & Embler, 2006).

Section 504 and ADA

Section 504 and the ADA provide civil rights protections to individuals with disabilities. Section 504 was the first law protecting individuals with disabilities from discrimination in public places, institutions, places of employment, and entities receiving funding from the federal government (i.e., college or universities). The ADA was passed in 1990 and was designed to address the gaps left by Section 504, including protecting individuals with disabilities from discrimination by private institutions, entities and employers.

These two laws cover youth with disabilities in postsecondary educational settings. They differ from the protections and entitlements offered by the IDEA in several important ways. For instance, under IDEA, schools are responsible for locating youth with eligible disabilities who are in need of services and for providing individualized services and supports. Section 504 and the ADA make it the responsibility of the individual with a disability to disclose his/her disability. Furthermore, the college or university only needs to provide access to individual students, through the provision of

reasonable accommodations, to physical buildings, classrooms and instruction to the extent provided to non-disabled individuals. There are no requirements that a youth benefit from his or her education.

Although the legal protections and entitlements offered by Sec. 504, the ADA and the IDEA have helped to increase the number youth with disabilities who are accessing higher education, the percentage of youth with disabilities enrolling in 2- and 4-year colleges and universities still falls short of their peers without disabilities. The following section provides an overview of what we know about the enrollment of youth with disabilities in higher education.

Youth with Disabilities and College Attendance

Before discussing what is known about youth with disabilities and their college attendance, it is important to distinguish between those youth covered under Section 504 and the ADA and those identified under the IDEA. Both Section 504 and the ADA have broader definitions of what constitutes a disability. The definition of disability in these two laws is three-pronged and includes: any person who (i) has a physical disability or mental impairment which substantially limits one or more of such person's major life activity, (ii) has a record of such an impairment, or (iii) is regarded as having such an impairment (29 USC § 794). In contrast, youth with disabilities covered under the IDEA must have one of 13 disabilities defined under the law and require special education by reason of having such a disability (Yell, 2006). This is a two-part definition and assumes that youth who are eligible under IDEA would have to demonstrate an adverse educational impact such as low achievement.

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With regard to this study, youth with disabilities refers to those who have been identified as having a disability and determined to be eligible for special education and related services under IDEA. The rationale for the focus on only youth receiving special education is as follows: first, data are collected on this population of individuals with disabilities by the school systems and then reported to the federal government. This reporting is the only accurate picture of youth with disabilities being served in public education. There are no data on those students with 504 plans. In addition, the IDEA specifically requires that certain procedures and services be provided and these are documented on IEPs. Thus, there is a sense of the general types of educational services and experiences this group of youth may have had. This is not true for youth with disabilities who have accommodations under Section 504 plans.

The research pertaining to factors related to youth with disabilities attending college is limited and a majority of this research is dated. However, data obtained from a longitudinal nationally representative study of 9,230 youth with disabilities who were between 13 and 17 in 2001 (Cameto, Levine, & Wagner, 2004) indicated that almost half of the youth in the sample had transition goals that included attending a 2- or 4-year college or university. However, only 5.7% of youth with disabilities were enrolled in a 4-year college or university within two years after they left high school and only 9.7% of youth with disabilities were enrolled in 2-year colleges (Newman, 2005). This same study also found that as family income increased, the percent of youth with disabilities who planned to attend a 2- or 4-year college or university also increased (Cameto, et al.). Another study (Horn, Berktold, & Bobbitt, 1999) found that more than half of youth with

disabilities identified in the in the National Education Longitudinal Study (NELS:88) were "not qualified" for admissions to a 4-year college or university (Horn, et al.).

Studies of factors that promote enrollment of youth with disabilities in colleges or universities have produced mixed results. Among the factors found to predict college enrollment were extracurricular activities (Miller, et al., 1990); achievement, quality of instruction received in secondary school, transition planning, parent satisfaction with high school instruction and student satisfaction with high school instruction, parents felt students didn't need help (Halpern, Yovanoff, Doren, & Benz, 1995); parent involvement in students education in grade 12, and parent expectations that a student will attend college (Wagner, et al., 1993); educational aspirations in grade 12, enrollment in a college preparatory curriculum in high school, and successful achievement of a high school diploma or equivalent (Rojewski, 1999). It is important to note that the majority of the research in this area did not look exclusively at either enrollment in or aspiration to attend 2- and 4-year colleges or universities. Also, few studies have compared youth with disabilities to their peers without disabilities. The research predicting college enrollment among youth with disabilities has also not fully examined the interaction between disability and academic variables, such as GPA, math coursework, and academic track. Although there are several studies that included GPA and specific coursework, the studies are dated. Only two studies (Rojewski, 1996; Wagner, et al.) examined school context variables (i.e., demographics, etc.) as they relate to postsecondary enrollment.

An important omission in the research literature is that none of the studies have used multilevel models in order evaluate the relative effects of multiple variables. The importance of multilevel modeling is that students are nested within schools. Therefore,

youth with and without disabilities who are enrolled in the same school share similar experiences. Multilevel modeling allows one to account for the common school effects in determining predictors of college enrollment for an individual student. Another problem with the existing research literature is that most of the studies were conducted prior to 1990 and therefore do not reflect the changes in public laws that have increased opportunities for youth with disabilities.

College Choice

In addition to the descriptive research that been conducted with youth with and without disabilities, college choice is another well established area of research. One particular model of college choice was developed by Hossler and Gallagher (1987) as a means of explaining the relative contribution of selected variables on choosing to attend college. This model consists of three stages: predisposition, search, and choice. Studies have examined the contribution of variables within each of the three stages. The Hossler and Gallagher model assumes that choosing to attend college begins early in a student's educational career. The variables investigated include student characteristics, educational activities, and school characteristics. This model informed the present study and helped to define the variables of interest.

Purpose of the Study

This study was designed to address the gaps in the research literature identified above. Thus, there were two main purposes of the study. The first purpose of this study was to compare the differences in plans to attend a 2- or 4-year college between youth with and without disabilities on selected variables. A second purpose was to identify the

relative contribution of selected family, student, academic, and school contextual factors

in predicting plans to attend a 2- or 4-year college or university after graduation among

students with and without disabilities. The study utilized data obtained from the

Education Longitudinal Study of 2002 (ELS:02), which is a nationally representative

longitudinal study of youth who were in 10th grade and enrolled in public or private

secondary schools in the United States in 2002. Specifically, the data that were analyzed

were obtained from the first and second waves of data collection as well as transcript

data.

ELS:02 Database

This study used data obtained from ELS:02, which is a longitudinal study that

began following a nationally representative sample of youth in 10th grade beginning in

2002. Surveys were completed by youth, school administrators, math and reading

teachers, school librarians, and parents. In addition, cognitive testing of the youth in the

sample was conducted and a survey about the school facilities that the youth attended was

conducted. The ELS:02 is intended to provide both a longitudinal picture of the sample

of youth across time as well as to provide a comparison to previous longitudinal cohorts,

such as NELS:88.

The ELS:02 did not over sample students with disabilities. However, unlike

NELS:88, ELS:02 did make an attempt to retain as many youth with disabilities in the

sample as possible. While there are several different variables within the database that

attempt to identify youth with disabilities, none of them is ideal. The first variable was

taken from the school roster and indicated whether a student had an IEP. In addition,

there were questions on the parent, teacher and youth surveys as well as information

taken from the transcript study that could indicate a disability. Selecting the analytical sample for this study proved challenging and will be discussed further in Chapter 3.

Research Questions

Three main questions guided the research:

Research Question 1: What are the differences between youth with IEPs who plan to attend a 2- or 4-year college and those youth with IEPs who do not plan to attend on the following 10th and 12th grade ELS:02 variables: demographics (i.e., race/ethnicity, SES, parental education), (b) student characteristics (i.e., gender, educational aspiration, parental expectation), (c) secondary experiences (i.e., high school academic coursework, math pipeline, GPA).

Research Question 2: How do youth with IEPs who plan to attend a 2- or 4-year college or university compare to youth without disabilities who plan to attend a 2- or 4-year college or university on the following 10th and 12th grade ELS:02 variables: demographics (i.e., race/ethnicity, SES, parental education), (b) student characteristics (i.e., gender, educational aspiration, parental expectation), (c) secondary experiences (i.e, high school academic coursework, math pipeline, GPA).

Research Question 3: Which youth academic experiences and school context variables predict whether a youth with and without an IEP has a plan to attend a 2- or 4-year college or university in 12th grade and do these factors differ between the two groups of youth?

Importance of this Study

This study extended current knowledge regarding youth with disabilities and their plans to attend 2- and 4- year college or university by: (a) comparing youth with disabilities to their peers without disabilities on certain key family, student characteristics, academic, and school contexts; (b) examining the variables that predict college plans among students with and without disabilities; and (c) examining the differences that high schools can have on the outcomes of youth with and without disabilities. Understanding what factors may contribute to whether a student with a disability plans to enroll in a 2- or 4-year college or university is important to policymakers, special education administrators and practitioners who develop and implement programs, such as transition. It is also particularly important to identify those factors that can be impacted by schools, such as access to higher level coursework or developing transition plans that focus on attending college. Thus, it is important to identify how schools can help more youth with disabilities aspire and plan to attend and subsequently enroll in college. This study was intended to address the gaps in the research and thus expand our knowledge of those factors that predict the plans of youth with disabilities to enroll in 2- or 4-year colleges. Due to limitations of the data base, it is impossible to know whether the students who planned to attend college actually enrolled or obtained a degree. Nonetheless, aspiring and planning to attend are important first steps toward completing college.

Definitions of Terminology

2- or 4- Year College or University: An institution of higher education that awards an associate or bachelors degree upon program completion.

Analytical Subsample: The group of youth in ELS:02 for whom the schools had identified their IEP status in grade 10 and those missing the IEP status variable, but had taken some credit in special education resource room during high school.

Chi-Squares: A term to refer to a group of inferential statistics that compare groups on variables that are nominal in nature.

Cohort: A group of individuals representing a population at a particular point in time.

College Choice: The process by which a number of variables through different stages influence a youth's decision and attendance to higher education.

College Qualification Index: Variable developed by Berkner and Chavez (1997) and is a composite of cumulative academic course GPA, senior class rank, 1992 NELS aptitude test scores, and the SAT and ACTS scores.

Crammers V: Established the strengthen of association between variables in the chi-square analysis. The results are restricted from 0 to 1.

Curriculum Track: The self-report belief of a youth's academic track in high school in college prep, general education or vocational education coursework.

Educational Aspiration: The highest level of postsecondary education desired by an individual, whether for themselves or for another.

ELS:02: National Center for Educational Statistics nationally representative database following a cohort of 10th grade youth in 2002 for 10 years.

HGLM: A two- or three-level binary outcome statistical model that takes into account the nested nature of individuals within groups, i.e., youth within schools.

Higher Education: The entire universe of 2- and 4-year college or universities within the United States of America.

First Generation: A youth whose parents had never attained college and plans to or is enrolled in a 2- or 4-year college or university.

Individual with Disabilities Education Act (IDEA): The federal legislation that outlines the requirements of educating a child with a disability from birth through graduation or 21 years of age.

Individualized Educational Plan (IEP): A document required for all youth with disabilities in special education listing the student's educational goals, services, supports, and accommodations in order to succeed in K-12 public education.

Listwise Deletion: The method which deletes all cases that do not have data on particular variable.

Math Pipeline: This refers to the variable designed originally by Burkam and Lee (1997) and categorizes the math sequence of the youth by labeling the highest math course taken and received credits for in high school. The ELS:02 database has broken this variable down to seven categories: non-academic math; low academic tracking; middle academic math I; middle academic math II; advance math I; advance math II; and advance math III.

Panel Cohort: Those individuals who were selected and participated in the ELS:02 base year, first follow-up and have transcript data available.

Plan to Attend: The expressed intention of a student in spring of 12th grade to attend a 2- or 4-year college or university after high school.

Restricted Data: This data set contains information that can lead to identifying the schools in the study and therefore requires special access in order to use and publish the data.

School Context: The shared school environment and experienced had by all individuals within the school.

School-Level Variable: Data provided by the school administer, librarian/media specialist, and/or facility checklist that relates to the school environment and is applicable to all youth attending that school.

Standardized Residuals: Provides a standard means to evaluate which cells in the chi-squares is contributing to rejecting the null hypothesis.

Student-Level variable: This data is collected by the youth, their parent, and/or their teachers and relates to experiences and characteristics only held by that youth.

Transition Services: The federal requirement under IDEA that requires that all youth with disabilities in special education are provided with a transition plan on related services in order to reach their postschool goal.

CHAPTER II

Literature Review

The purpose of this study was two-fold. The first purpose of this study was to explore the differences between youth with disabilities on their plans to attend a 2- or 4-year college and compare those youth to their peers without disabilities who plan to attend a 2- or 4-year college or university. In addition, identify the relative contribution of the selected family, student, academic, and school contextual factors in predicting a student's plan to attend a 2- or 4-year college or university after graduation. The study utilized data obtained from a nationally representative study of 10th graders in school in the united states in 2002. Specifically, data were analyzed from the first and second waves, including transcript data, of the Educational Longitudinal Study of 2002 database (ELS:02).

This chapter is organized into four sections. The first section provides a review of policies that support enrollment of youth with disabilities in colleges and universities, including a definition of disability. Particular focus is on the transition provisions in IDEA and the provisions in Section 504 and ADA. The second section provides a national picture of educational aspirations, high school experiences, and current participation in higher education among youth with disabilities who have received special education services. A third section provides a methodological review of the research that has examined the predictors of enrollment of youth with disabilities in 2- or 4-year colleges or universities. The final section provides an overview of the general education literature on college choice with a specific focus on how this guides the present study.

Legal Protection of Youth with Disabilities

The education of youth with disabilities has evolved over the past 40 years. In terms of the transition to post-secondary education, we can look at the passage of Section 504 and P.L. 94-142 as the first step in that these two laws provided students with disabilities access to education. In the 1980's, there was a growing recognition of the need to focus on how to improve long term outcomes, such as employment. The major turning point occurred in 1990 when the transition requirements were added to the special education legislation and the ADA was passed. These two laws provided greater focus on the postsecondary opportunities of youth with disabilities. However, the focus was still much on employment. Since the 1997 IDEA amendments, there has been an increasing focus on providing students with disabilities access to the general education curriculum and increasing the accountability of schools for improving student achievement in subject matter curriculum. All of these changes in law have provided a greater chance for a youth with a disability to enroll in college. This section reviews some of the most important changes in law.

Access for All

The 1970s was the era of creating access for all students with disabilities to a public education. The National Council on Disability (2000) reported that at least one million students with disabilities were not receiving an education prior to the passage of the 1975 federal special education legislation, P.L. 94-142. This law came about, in part, as a result of lawsuits brought against school districts for discriminating against students with disabilities and denying them the right to public education [i.e, Pennsylvania Association for Retard Children v. Commonwealth of Pennsylvania (1971) and Mills v.

Board of Education of the District of Columbia (1972)]. In addition, disability rights groups began to pressure the federal government to provide protection against discrimination. As a result, two pieces of legislation were passed: Section 504 of the 1973 Vocational Rehabilitation Act and The Education for All Handicapped Act of 1975 (EHA).

Section 504 provides protection to individuals with disabilities from discrimination by programs and services receiving federal financial assistance (Yell, 2006). In 1975, Congress signed into law The Education for All Handicapped Act of 1975 (EHA), which was renamed the IDEA in the 1990 amendments. The EHA provided each eligible student with a disability between the ages of 3 to 22 the right to a free appropriate public education (FAPE), defined as specialized education and services designed to meet the individual needs of students. In addition, the education must be educationally beneficial (Hardman, Drew, & Egan, 2008).

The main principle of the EHA was a zero-exclusion policy that stated regardless of disability type or severity, the public school had to provide special education and related services to the youth with disability (Hardman, et al., 2008). In addition to this principle, there are five fundamental rights provided to youth with disabilities, they are: FAPE, non-discriminatory and multidisciplinary assessments, procedural safeguards, and an Individualized Education Program (IEP) in the Least Restrictive Environment (LRE; Hardman, et al.). The entitlement to FAPE requires that special education and related services be provided at no cost to the parents.

The IEP is a written document that specifies the following information: (a) the student's current levels of educational performance, (b) measurable annual goals, (c) the

special education and related services and supplementary aids or services to be provided to the student, (d) the accommodations provided in the administration of state- or district-wide assessments, (e) projected beginning date for the beginning of services and anticipated frequency, location, and duration, (f) how the student's progress toward the annual goals will be measured and how the parents will be regularly informed (Hardman, et al., 2008). The IEP is the documentation of what constitutes FAPE for any given student with a disability.

The IEP also specifies the setting, or LRE, in which services will be provided. As defined in the IDEA regulations, the LRE is a continuum of settings from general education classrooms to several totally separate public and private schools settings Hardman, et al., 2008). The IDEA gives preference to education in the general education classroom which is perceived as the least restrictive. If a student is taken out of his or her classroom, the IEP team must show how even with accommodations, modifications, and supplementary aids, the student's performance could not reach satisfactory levels (Hardman, et al.). A key part of IEP development for adolescents with disabilities is transition planning.

Conception of Transition Planning

As students with disabilities began to have access to public education, one of the areas of interest for the Office of Special Education and Rehabilitation Services (OSERS) and researchers became the outcomes of that education, specifically what happened to the youth with disabilities upon leaving high school. In the 1980s, several studies began to document these post-school outcomes and brought national attention to the poor post-school outcomes of youth with disabilities. As a result, there was a call for improving the

bridge from high school to post-school employment and other outcomes for all youth with disabilities.

In 1983, the EHA was amended (P.L. 98-199) and included a discretionary program to develop and support the school-to-work transition for youth with disabilities. The funding provided an opportunity for the field to develop and evaluate models of what would become known as transition services (Rusch & Phelps, 1987). The funding for this discretionary program was reauthorized in the 1986 amendments of EHA (P.L. 99-457). During this same time, there was a discussion in the field about what should be considered desirable postsecondary outcomes. Will (1985), a former Assistant Secretary of OSERS, provided a model of transition services. Will's model outlined three different levels of transition planning: transition without special services, transition with time-limited services, and transition with ongoing services. Although this model emphasized the fact that most youth with disabilities required additional supports to transition successfully to adult life, the model was particularly focused on supporting employment outcomes for a relatively small group of youth with cognitive disabilities.

This limited focus was criticized by the field. Halpern (1985) examined the model provided by OSERS and argued that employment can not be the sole purpose of transition services, especially when other areas (i.e., independent living, social skills) require support to meet the goal of gainful employment. Halpern developed a revised transition model to include not only employment, but also residential environment and social and interpersonal networks. However, this model of transition planning also did not address postsecondary education as an outcome or goal.

A major factor in increasing attention to the post-school outcomes of students with disabilities was the release of the findings from the National Longitudinal Transition Study (NLTS). This nationally representative study of a cohort of students with disabilities who were followed from 10th grade until five years after leaving school provided, for the first time, a national picture of the outcomes of youth with disabilities and confirmed that youth with disabilities were not successfully transitioning into post-school life (Wagner, 2005).

In 1990, the EHA was reauthorized and became the Individualized with Disabilities Education Act (IDEA). Among the changes made to the Act were those that required transition services to be provided to all youth with disabilities. The law also provided a definition of transition services that included postsecondary education outcomes. Specifically, a transition service was defined as:

> a coordinated set of activities for a student, designed within an outcome-oriented process, which promotes movement from school to post-school activities, including post-secondary education, vocational training, integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation. The coordinated set of activities shall be based upon the individual student's needs, taking into account the student's preferences and interests, and shall include instruction, community experiences, the development of employment and other post-school adult living objectives, and, when appropriate, acquisition of daily living skills and functional vocational evaluation. (IDEA, 20 U.S.C. 1400 § 602 (30) (A-C))

In addition, other provisions were added to the law to "mandate that a statement of needed transition services be included in the youth' IEP by the age of 16" (Neubert, 2006, p. 39) and to include requirements that transition services: (a) be based on multiple postsecondary outcomes and a coordinated set of activities, (b) include students in planning, (c) consider individual student interests and needs, and (d) include interagency collaboration between service providers as part of the planning process (Neubert).

Another major event in 1990 was the passage of the ADA. This law expanded the scope of protections offered under Section 504 in several areas, notably by covering not just entities that receive federal funding but private entities as well. In particular, Title III of the ADA "prohibits private entities that operate places of public accommodation from discriminating against a persons with disabilities by denying them full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations they provide" (Thomas, 2002, p.25). This includes private colleges that do not receive federal funding.

The legislative changes of the 1980's and early 1990's began to bring national attention to the need for a focus on what happens to youth with disabilities as they leave public education. The attention resulted in specific provisions for helping these students bridge the transition from high school to adult life, specifically employment. It was not until the late 1990s that increased attention was given to access to college for youth with disabilities.

Era of New Opportunities and Access

In 1997 the IDEA was again reauthorized (P.L. 105-17) and some changes were made to the transition requirements. These included the requirement that a statement of

transition services begin at age 14 and focus on the youth's course of study (Neubert, 2006). The statement of transition services were required to be updated annually. Also, youth and parents were to be made aware of high school graduation requirements and diploma options (Neubert).

With respect to increasing college enrollment, perhaps the most important change made in 1997 was the requirement that students with disabilities have access to general education curriculum. This new provision was added to the IEP requirements. IEP teams needed to determine students' present level of performance in the general education curriculum as well as to develop supports and services that would allow students with disabilities to participate and make progress in the general education curriculum (Neubert, 2006). The need for access to the general education was further reinforced by the requirement that students with disabilities participate in district- or state-wide testing programs.

These requirements were supported and strengthened by the 2001 amendments to Title 1 of the Elementary and Secondary Education Act (P.L. 107-110), named the No Child Left Behind Act (NCLB). This law and the accompanying regulations mandated that all youth with disabilities receive instruction in grade-level subject matter based on state standards and that these youth be included in the state assessment and accountability systems (McLaughlin & Embler, 2006). Specifically, the state assessment scores of youth with disabilities must be disaggregated and reported at school, district and state levels and schools, districts, and states are to be held accountable for making "adequate" yearly progress for this subgroup of students (McLaughlin & Embler; Yell & Dragow, 2005). The focus on accountability and access to the general education curriculum created

incentives for schools to provide instruction in academic content to all students, including

those with disabilities. This attention to academics supported the transition goals of

enrollment in post secondary education for students with disabilities.

The latest reauthorization of IDEA in 2004 (P.L. 108-446), continued the focus on

academics and improving the postsecondary outcomes of students with disabilities. In

these amendments, the purpose of transition is:

> to ensure that all children with disabilities have available to them a free
>
> appropriate public education that emphasizes special education and related
>
> services designed to meet their unique needs and prepare them for further
>
> education, employment, and independent living
>
> (IDEA, 20 U.S.C. 1400 § 601 (d)(1)(A)).

In addition, the 2004 amendments defined transition services as:

> (A) designed to be within a results-oriented process, that is focused on
>
> improving the academic and functional achievement of the child with a
>
> disability to facilitate the child's movement from school to post-school
>
> activities, including post-secondary education, vocational education,
>
> integrated employment (including supported employment), continuing and
>
> adult education, adult services, independent living, or community
>
> participation; (B) is based on the individual child's needs, taking into
>
> account the child's strengths, preferences, and interests; and (C) includes
>
> instruction, related services, community experiences, the development of
>
> employment and other post-school adult living objectives, and, when

appropriate, acquisition of daily living skills and functional vocational

evaluation (IDEA, 20 U.S.C. 1400 § 602 (34)(A-C)).

The changes made to the transition requirements are notable in several areas. For one, the definition shifts from outcome-oriented to results-oriented and focuses on improving the academic and functional achievement of the student with a disability to facilitate movement from school to post-school. The focus on determining post-school goals based on the "child's strengths" (IDEA, 20 U.S.C. 1400) along with a student's preferences, interests, needs and age-appropriate transition assessment is also important. Finally, developing a course of study and transition services to assist the student in meeting his or her postsecondary goals and requiring a summary of performance which highlights a student's academic achievement and functional performance at the time he or she exits the public school system are additional new requirements (Neubert, 2006). These changes could potentially assist a youth's transition to college by designing a course of study related to their postsecondary goal of higher education. In addition, providing a youth with a disability with a summary of their performance in high school can allow them to advocate for accommodations when they arrive in higher education.

Summary

Over the course of thirty-five years, since the passage of the first laws that have provided youth with disabilities opportunities for education, there has been an increasing awareness of the need to ensure that these youth can access a full range of post-school opportunities. Although civil rights protections are fundamental, it has also become apparent that more is required for youth with disabilities to transition to adult life. Transition services were originally designed to address employment but now also include

independent living, community participation, vocational education and postsecondary

education. The latter includes enrollment in 2- and 4-year colleges and universities.

Transition services are not enough to increase that enrollment if youth with disabilities do

not also have a full opportunity to access general education subject matter courses and to

be part of the federal and state accountability systems designed to raise expectations and

achievement among all secondary students. Thus, youth with disabilities now have

unprecedented opportunity to reach goals that were not considered as important several

decades ago. Policy makers are hopeful that both the academic opportunities as well as

access to postsecondary education will increase.

In the next section of this literature review, I provide an overview of: (a) the

demographics of who is being served in special education, (b) the plans for postsecondary

education among youth with disabilities of youth with disabilities who are still in high

school, (c) the academic experiences of these youth, and (d) and the number of youth

with disabilities who enroll in 2- and 4-year colleges or universities.

Youth with Disabilities: Characteristics, Experiences, and College

As noted in Chapter 1, the focus of this study is on students with disabilities who

have IEPs and have received or are receiving special education services. Thus, the

following pertains to students with IEPs.

Data Sources

The data presented in this section come primarily from three sources: the state

reported data (IDEA, 20 U.S.C. 1400 § 618) that are required to be submitted to the U.S.

Department of Education annually, the National Longitudinal Transition Study 2

(NLTS2), and the NELS:88. The NLTS2 is a nationally representative longitudinal study of 11,276 youth with disabilities, ages 13- 16. This study, which began in 2000, is following a sample of almost 12,000 youth over a 10-year period. The data presented below were taken from reports (Cameto, Levine, & Wagner, 2004; Wagner, Newman, Cameto, Garza, & Levine, 2003; Wagner, Newman, Cameto, Garza, & Levine, 2005) of the first wave one and two of the data collection. The NELS:88 is a nationally representative study that followed a sample of almost 25,000 youth beginning in 8th grade. The first data collection was in 1988 and final data collection in 2000. Youth with disabilities in NELS:88 were identified by the 8th grade parent survey. Under Section 618 of IDEA, states are required to report on number and percent of children with disabilities by gender, race/ethnicity, LEP, and disability category by their LRE (IDEA, 20 U.S.C. § 1400, 2004).

According to the 2005 state reported data, 12% of the school age population ages 6-17 had an IEP (IDEA Data 2005, www.ideadata.org, Retrieved August 3, 2007). Fifty-two percent of the 12% were youth with disabilities between the ages of 12-17. In 2005, 54.6% of youth with disabilities graduated with a diploma, another 16% received a certificate of completion or attendance, 28 % dropped out of high school, and the rest either aged out at 21 or were deceased (IDEA Data 2005, www.ideadata.org Retrieved August 3, 2007).

In the NLTS2 sample, there are almost twice as many males as females receiving special education in secondary school (Marder, Levine, & Wagner, 2003). Further, among the sample of 11,276, 62.1% of the youth were white, 20.7% were African Americans, 14.1% were Hispanic and 2.7% were grouped into the other category

(Marder, Levine, & Wagner, 2003). In terms of annual household income of youth with disabilities, 24.8% of the students in the sample were from families living below the 2000 federal threshold (Marder, Levine, Wagner, & Cardoso, 2003). Finally, 62% of the youth with disabilities come from families where the head of the household has a high school degree or less, 23% come from families where one or both parents have some college and 14% of youth with disabilities come from families where one or both parents have a bachelor's degree or higher (Marder, et al.).

Trends in College Attendance

The next section presents data regarding the number of youth with disabilities who enroll in college. This is followed by the characteristics of these youth and information on their secondary academic preparation for college.

According to NLTS2 data obtained from the wave two parent/youth interview conducted in 2003, 8.6% of the 8,210 youth with disabilities who had left public school took at least one class in a 4-year college or university and 5.7% of youth were currently attending a college or university (Newman, 2005). About a fifth (19.7%) of the youth had taken at least one class in a 2-year college since high school, although only 9.7% of these youth were enrolled two years after leaving high school (Newman).

In addition, almost half (46.8%) of the 11,276 students with transition goals in the NLTS2 sample had indicated that they planned to attend a 2- or 4-year college or university (Cameto, Levine & Wagner, 2004). However, youth can have more than one postsecondary transition goal, such as attending a 2- or 4-year college or university and receiving vocational training, and Cameto et al. found that a "large percentage of youth with learning disabilities, speech and other health impairments, or emotional disturbance

have goals of both attending college (44% to 57%) and participating in vocational training (43% to 58%)" (p. 16).

Among those youth with disabilities who had a postsecondary transition goal of attending a 2- or 4-year college or university, 37.7% came from households with $25,000 or less in annual income; 43.2% came from households with between $25,001 to $50,000 in income and 58.4% from households with over $50,001 in annual income (Cameto, Levine, & Wagner, 2004). The differences among racial/ethnic groups were not great. Hispanic youth with disabilities were the largest group with postsecondary goals of attending college (48.8%). This was followed by 47.8% of the white youth and 40.2% of African American youth (Cameto, et al.).

Finally, in terms of parental expectations, in the NLTS2 sample, 25.8% of parents of the youth with disabilities who had exited or graduated high school by 2003 believed that their child "definitely will attend school after high school" and another 34.8% believed that their child "probably will" attend school after high school. Only 10.4% believed their child "definitely will" graduate from a 2-year college and 7.5% believed that their child "definitely will" graduate from a 4-year college or university (Newman, 2005). Among those parents whose child had completed high school, 11.9% said their child "definitely will" graduate from a 2-year college and 9.3% of parents said their child "definitely will" graduate from a 4-year college or university.

Secondary Academic Experiences

This next section examines the school experiences of youth with disabilities and the degree to which they reflect college readiness. Again, the NLTS2 data indicated that among the full sample of 11,274 youth with disabilities, 69% took general education

classes. The percent of youth with disabilities in general education academic classes varied: 49% in Language Arts, 53% in Mathematics, 66.1% in Science, 64% in Social Studies and 85% in Foreign Language (Wagner, 2003). What the data did not indicate was the level or type of courses (e.g., remedial, advanced) in each subject matter area (e.g., algebra 1, geometry) or how many classes were taken by these youth within the subject area.

Horn, Berktold, and Bobbitt (1999) used the college qualification index[i] to evaluate all youth with disabilities who had graduated from high school in the NELS:88 database. They found that 56% youth with disabilities were deemed "not qualified," and only 15% of youth with disabilities were considered "very" to "highly qualified. These authors concluded that "even though a majority of youth with disabilities aspired to a college degree…these youth may not be getting the academic preparation necessary for them to achieve their goals" (Horn, et al., p. 32).

Another interesting finding in the Horn, et al. study was that even among youth with disabilities who were minimally qualified for admission to a 4-year college (college qualification index), 41% attended a 4-year college or university. When youth with disabilities met the standard of "very" to "highly" qualified status, they enrolled in higher education at a rate similar to their peers without disabilities. Regarding coursework, in the Horn et al. sample, more than double the percentage of youth with disabilities took remedial English and math as compared to their peers without disabilities (54% vs. 26%), and only 31.4% of youth with disabilities took at least one advanced placement course as compared to 46.4% of their peers without disabilities.

Findings from the various studies noted above indicate that there are several characteristics of youth with disabilities and their school experiences that could point to lower rates of college enrollment. First, males and certain minority groups, specifically African Americans, are overrepresented in the population of secondary students who are receiving special education. The research on college enrollment for all youth indicates that males, youth from low SES, certain minority groups, and parents with no college education were less likely to attend college (Berkner & Chavez, 1997). Further, youth with disabilities are more likely to come from families in which neither parent has attended a college or university which has also been linked to lower rates of college attendance (Marder, et al.). Finally, youth with disabilities are more likely to be from families who are living below the poverty threshold than their peers without disabilities (Marder, et al.).

In terms of aspiration and expectation, almost half of the youth with disabilities had planned to attend a 2- or 4-year college or university, whereas only a quarter of parents of youth with disabilities believed that their child definitely would go on to a college or university. While the aspirations are apparent, the reality is that not even a third of youth with disabilities appeared to be qualified to attend a 4-year college or university based on the types of coursework reported in Horn et al. study.

The next sections further examine the research specifically related to factors that predict college access for youth with disabilities. When appropriate, research pertaining to youth without disabilities is reviewed to show similarities and differences.

Methodological Review Special Education Research

In this section, 10 studies explored student, family, academic and high school predictors related to the access of youth with disabilities to 2- and 4-year colleges or universities are reviewed. The 10 studies were identified through a search of Educational Abstracts, ERIC, Dissertation International and reviewing references of all the identified articles obtained from the first three sources. Studies were selected using the following criteria: (a) published in a peer-reviewed journal, (b) sampled youth with disabilities as defined by IDEA, (c) included variables that related to high school experiences or high school characteristics, and (d) used quantitative methods. Search terms includes: college, university, postsecondary education, youth with disabilities, individuals with disabilities, and educational aspirations. Nine of the 10 studies met all these criteria. The Chen (2004) study examined the population of youth with and without disabilities who took American College Test (ACT). Under this study, youth with disabilities is defined as having a disability under Section 504.

In the following critique of the 10 studies, the Issac and Michael (1997) "criteria for evaluation of research report, article, or thesis" was applied (p. 241). These guidelines provide a comprehensive list of items to examine in evaluating prior research. Although the list is extensive, only the following areas will be examined for the purpose of this study and include: (a) the statement of purpose or problem, (b) the sample, (c) the instruments and data collection procedures, and (d) the analyses.

Purpose

The statement of purpose is one of the most important parts of a study, since it explains to the reader what the researcher is going to study. The methodology and

findings should fall within this statement of purpose (Huck, 2004). Table 1 provides a summary of the purpose of each of the studies.

INTEREST TABLE 1 ABOUT HERE

In addition to the purpose, authors may state a hypothesis for their study. Disclosing the hypothesis a priori allows for the reader to evaluate the author's expected outcome for the study (Huck, 2004). Only Rojewski (1996) stated a hypothesis. Huck states that disclosing a hypothesis is not always an issue if the author does not have a preconceived notion of what the outcome should be. The studies in this review were for the most part exploratory and descriptive, and did not test hypotheses.

Sample

Understanding the sample is essential to understanding the outcome of a study because the choice of sample and sampling procedure impacts the generalizability of the findings to an appropriate population. There are different types of sampling procedures that fall into two categories, probability and non-probability methods. Probability sampling provides each member of the defined population a specific probability of being selected. These techniques include simple random, stratified, cluster, and systematic sampling (Gay & Airasian, 2003). Non-probability sampling is the selection of the sample through nonrandom methods, which includes convenience, purposive, and quota sampling methods (Gay & Airasian).

Nine of the 10 studies used samples. Chen (2004) included the entire population of youth who took the ACT in 1999. Two studies used random sample (Miller, et al., 1990; Miller, et al., 1991), while one study used stratified random sample at the state level (Halpern, et al., 1995). One study used a cluster sample of two high schools (Hitchings, et al., 2005) and White et al. (1983) used a cluster sample of the youth with disabilities in their study, while they randomly selected youth without disabilities in their study. Four of the studies analyzed data taken from large nationally representative studies. Three of the studies used stratified random sample, where schools were the stratified unit (Cardoza & Rueda, 1985, Rojewski, 1996; 1999). One study used a stratified random, but the school district was the stratified unit (Wagner et al., 1993).

Three of the four studies used large-scale longitudinal databases and looked at specific cohorts. There are many advantages to using these types of databases, but there are also cautionary items that must be taken into consideration. Michael and Issac (1997) provide the following warnings about cohort analysis: "(1) those produced by influences associated with aging, age effect; (2) those produced by influences associated with cohort status- cohort effects; and (3) those produce by influences associated with each period of time- period effects" (p. 63). One concern for studies that use cohort analysis is attrition and the ability to generalize to the population over an extended time period (Issac & Michael). Of the studies that use cohort analysis (Cardoza & Rueda, 1986; Halpern, et al., 1995; Rojewski, 1996; 1999, Wagner, et al., 1993). It is important to realize that this is one the biggest threats to the study, particularly to the generalizability.

On the other hand, large-scale nationally representative databases are a great resource for providing descriptive information about a population. Due to their size, they

allow for the study of characteristics of different subgroups and can be useful in making policy decisions regarding how to target interventions (Schneider, Carnoy, Kilpatrick, Schmidt & Shavelson, 2007). One of the downsides of using large-scale nationally representative databases is a lack of control over the sample selection. The researcher must be aware of sampling procedures and bias in order to evaluate the population and to generalize the findings. Table 2 provides an overview of the large-scale studies used in four of the research studies reviewed.

INSERT TABLE 2 ABOUT HERE

These three databases contained data that were collected over multiple years and allowed researchers to follow a cohort of youth across time. The HS&B is a nationally representative sample of youth who were in 10th and 12th graders in 1980. These youth were followed for 10 years. The NELS:88 is a nationally representative sample of youth who were in 8th grade in 1988. This group was followed 12 years. The NLTS was a representative sample of youth with disabilities between 15- 23 years of age who were receiving special education in 1985- 1986 school year. These youth were followed for six years.

One of the problems with these databases, except for NLTS, was that youth with disabilities were easily exempted from the samples. This could be due to several reasons including the fact that the sampling procedures included first drawing a nationally representative random sample of schools and then sampling youth within the schools. Youth with disabilities not attending regular schools would not have an opportunity to be

sampled. In addition, youth with disabilities could be excluded if they were judged to be

unable to complete certain measures such as the school administrator could decide that

that the "degree of their disability was deemed by school officials to make it impractical

or inadvisable to assess them" (Ingels, Pratt, Rogers, Siegel, & Stutts, 2004, p. 40).

Finally, disability status was student reported in HS&B, whereas in the NELS:88 study,

disability status was primarily determined through parent reported variable in 8th grade.

Furthermore, dependent on variables used in analysis, it can be unclear whether a student

with a disability identified by the parent was receiving special education services (Rossi,

Herting, Wolman, & Quinn, 1997). Only NLTS drew a nationally representative sample

of youth with disabilities who were receiving special education.

Rojewski (1996; 1999) acknowledged these problems with the NELS:88 sample.

There is no ideal nationally representative database that includes samples of youth with

and without disabilities. The National Center for Educational Statistics (NCES) continues

to address this issue. To date NCES has retained a greater number of youth with

disabilities in ELS:02 study than in previous studies. This is the database that will be used

in my study. Complete information on the ELS:02 will be discussed in chapter 3.

Study samples. Three of the nine studies used samples to conduct their study. It

was noted that four of these studies used nationally representative data (Cardoza &

Rueda, 1986; Rojewski, 1996; 1999; Wagner, et. al., 1993). Two other studies used

secondary data collected from the State of Iowa (Miller, Snider & Rzonca, 1990; Miller,

et al., 1991). Finally, in last three studies, these researchers collected the data (Halpern, et

al., 1995; Hitchings, et al., 2005; White, et al, 1983). Table 3 provides details on the

sample used for analysis for each of the nine studies.

Rojewski (1996; 1999) and Wagner, Blackorby, Camento, and Newman (1993)

used weighted samples in order to be able to generalize to the population. Cardoza and

Rueda (1983), who used a nationally representative large-scale database, did not weight

their sample, whereas Chen (2004) used the entire population of 1999 ACT test takers in

her analysis. This lack of clarity about the samples is problematic since making

inferences to the general population is not possible or appropriate (Huck, 2004). One

thing to highlight in Table 7 is that the majority of the studies contained samples of youth

who graduated on or before 1992. Transition services were not required for all youth with

disabilities until the IDEA of 1990, and it was not until IDEA of 1997 that youth with

disabilities had to have access to the general education curriculum as demonstrated on

their IEPs. Thus, these youth may never have fully benefited from transition services

since they would have been at the end of high school when the requirements were put

into place and received the academic content instruction in self contained classrooms.

Finally, only five studies compared youth with disabilities to their peers without

disabilities (Chen, 2004; Cardoza & Rueda, 1986; Rojewski, 1996; 1999; White, et al.,

1983). White et al. used data from a non-cohort of youth without disabilities obtained

from the same school but only for one school year.

INSERT TABLE 3 ABOUT HERE

Sampling problems. Several issues should be noted regarding the samples

presented in Table 7. Huck (2004) states, "an empirical investigation that incorporates

inferential statistics is worthless unless there is a detailed description of the population or

the sample" (p. 121). The depiction of the sample is important for determining the generalizability of the results and for allowing for the research to be replicated. "If you do not know much about the members of the sample or how the researcher obtained the sample, then the inferential process cannot operate successfully- no matter how large the sample might be" (Huck, 2004, p. 119). The description of youth with disabilities in the sample is crucial because of the differing definitions of disability in the IDEA, Sec. 504, and the ADA. Also, the categories of disabilities including definitions have changed in the IDEA from one authorization to the next.

Nine of the studies had some type of problems with their sample selection, with issues in sample selection (e.g., Hitching, et al., 2005) and differences across groups with and without disabilities due to sampling selection (e.g., White, et al., 1983). A great example of demonstrating the generalizability of the disability type was in Halpern et al. (1995) study. They provided the reader with data on both the sample and population of youth with disabilities in each of the disability categories in each of the three states (i.e., Nevada, Oregon, and Arizona). This demonstration of a connection between the sample and population is not often provided; however, it does not report information on gender, ethnicity, and SES. Rojewski (1999) provided information on the number of youth by gender within the sample and only Rojewski identified the ethnicity of the participant. One of the most surprising issues with sampling selection was in Hitchings et al. study, where the year that sample was drawn from the schools was not provided. This is particularly problematic in special education since the reader needs to understand which IDEA amendments these youth's high school years were guided by, and which particular transition requirements were in place at the time. In addition, any particular changes in

the academic coursework or testing brought about by federal law (e.g., NCLB); need to be taken into consideration. The problems with the sample descriptions are threats to external validity, creating an inability to generalize beyond the study (Fraenkel & Wallen, 2003; Gay & Airasian, 2003).

Attrition, the loss of participants in a study after it begins, can have an impact on the results. If the group of participants who drop out differ from the group of participants who stay in, this can affect the differences between the groups being analyzed (Gay & Airasian, 2003). This is a threat to internal validity, which is "concerned with threats or factors other than the independent variable that affects the dependent variable" (Gay & Airasian, p. 339). If a study does not provide descriptive information about individuals who dropped out of the study, then the differences between the respondents and non-respondents cannot be determined. Therefore, the reader is unaware of how the study has been impacted regarding generalization to the population.

Instruments and Data Collection

Five out of the 10 studies that used large databases analyzed variables that had been collected using instruments and procedures developed for the original study. Cardoza and Rueda's (1985) study mentioned that the student self-administered survey was used to identify which youth reported having a disability. Although it is not stated which administration(s) the variable came from in the HS&B database. Wagner et al. (1993) used parent/student telephone interview from 1987 and 1990, secondary school transcripts, school program content forms and student school program forms from the NLTS study. Rojewski (1996; 1999) used the student second follow-up survey, student math and reading achievement scores in 12th grade, and the composite variables

developed by NELS:88. Rojewski does report the data on the achievement scores of past studies and of self-esteem/locus of control variables. Finally Chen (2004) reviewed all four of the ACT academic tests (i.e., English, Mathematics, Reading, and Science Reasoning), ACT Interest Inventory, and the Student Profile Section.

The other five studies collected original data (Halpern, et al., 1993; Hitchings, Retish, & Horvath, 2005; Miller, et al., 1990; Miller, et al., 1991; White, et al., 1983). White, et al. mailed out a survey to all the youth in their identified sample. Miller et al. (1990) and Miller et al. (1991) used the data collected form the Iowa Statewide Follow-up Survey Questionnaire, which was developed by a task force of special education teachers and administrators. Halpern et al. collected data through a computer-assisted telephone interview (CATI) of youth and parents. In addition they collected data on teachers through a written questionnaire. Finally, Hitchings, et al. used records of youth with disabilities that included their transition planning guide and a course comparison form.

The instruments used to collect the data must be reliable and valid to allow for appropriate generalizations. There is a concern not only with knowing an instrument's past reliability and validity scores, but with how the author of the current study determines that their instrument choice is appropriate for their sample and that it measures what it intends to measure. Only three of the 10 studies, reported reliability or validity on the instruments or variables used to collect the data (Chen, 2004; Rojewski, 1996; 1999). Chen (2004) reported the reliability and validity of the academic testing (.96 to .97) and ACT interest inventory (0.87 to 0.92). Rojewski (1996; 1999) did not report on the overall reliability and validity of the instrument, but rather provided reliability and

validity of the academic achievement tests as demonstrated in previous research. In addition, the reliability and validity of the NELS:88 composite variables of self-esteem and locus of control scales as it connected to previous research was reported. It should be cautioned here that for those studies using large scale databases, many of these studies provide technical guides providing one with the information on reliability on instruments and variables. But the lack of information calls into question the reliability and validity of the instruments used in these studies and should thus make readers skeptical regarding any inferences provided by the authors, especially those who collected their own data (Halpern, et al., 1995; Hitchings, et al., 2005; White, et al., 1983).

In terms of data collection procedures, Halpern et al. (1995) provided the inter-rater reliability of their collection methods. Halpern et al. had a second interviewer listen to six percent of the telephone interviews and record the responses separately to compare to the first interviewer's data entry. This method verified that the interviews were coded appropriately into the system between the two interviewers. Hitchings et al. (2005) reported the inter-rater reliability for the evaluation of the youth's transcripts. Every fifth document was reviewed by a graduate assistant for reliability, which had an agreement of 0.92 on the evaluations.

Analyses

The statistical technique the authors chose to analyze their data depended on the measurement scale of the variables being studied (i.e., nominal, ordinal, interval, or ratio). Isaac and Michael (1995) provided a list of the appropriateness of statistical tests to conduct with different measurement scales used for both the predictor and outcome

variables. All of the studies had the appropriate statistical test conducted with the variables chosen in the studies.

All of the studies that included large samples (ACT, HS&B, NLTS and NELS:88) have the advantage of having "smaller sampling errors, greater reliability, and increase[d] … power of a statistical test applied to the data" (Isaac & Michael, 1995, p. 101). With the increase in statistical power, the probability of finding significance is also increased. However, what is statistically significant is not necessarily of practical significance. Effect sizes are "a numerical way of expressing the strength or magnitude of a reported relationship, be it causal or not" (Gay & Airasian, 2003, p. 294). None of the authors of the studies reviewed provided the effect size of the analysis for the independent and dependent variables. Although results may be significant, the undetermined effect size of the variables downplays the statistical significance found in these studies.

Variables and Findings

This section provides an overview of the independent and dependent variables that were analyzed in the 10 studies as well as the findings from those studies. Table 4 highlights the independent and dependent variables that were examined in all 10 studies.

INSERT TABLE 4 ABOUT HERE

Across the studies, the following variables were shown to be related to either educational aspirations or postsecondary education attendance. An overall understanding of educational aspirations, both Rojewski (1996) and White et al. (1983) found that educational aspirations were lower for youth with learning disabilities, as compared to

their peers without disabilities. When examining race and disability, Cardoza and Rueda (1986) found that there were differences in educational aspirations between white youth with LD, Hispanic youth with LD, and white youth without LD. White youth without LD had the highest educational aspirations (Cardoza & Rueda).

In terms of family variables, income and parental encouragement was found to influence education aspiration and attendance. In three of the studies, income was a predictor of aspiration or attendance of a 2- or 4-year college or university for youth with disabilities (Chen, 2004; Rojewski, 1999; Wagner, et al., 1993). Parental influence on youth with disabilities outcome was another consideration. Wagner et al. found that when controlling for other factors, youth with disabilities whose parents expected their child to go on postsecondary education, the youth with disability was more likely to do so.

When turning our attention to student variables, Miller et al. (1991) found that gender was predictive of postsecondary attendance. Cardoza and Rueda (1986) found white youth without LD were more likely to attend college and the least likely group was Hispanic youth with LD. In terms of educational goals, Wagner, et al. found that youth with disabilities who had a goal of enrolling in postsecondary education was more likely to enroll. In addition, Wagner et al. found that youth with LD were less likely to attend postsecondary academic programs than youth with other disabilities, with the exception being youth with emotional behavioral or mental retardation. In the same study, youth with visual impairments were the most likely to go on to postsecondary academic programs. What was the impact of academic experiences in high school on a youth with disabilities aspirations or attendance in 2- or 4-year colleges or universities? One study found that the variables that predicted enrollment of a youth with LD in a 2- or 4-year

college or university were the same variables to predict youth without disabilities. These variables were educational aspirations at 12th grade, high school program, and high school diploma (Rojewski, 1999). In addition, high academic achievement, high-prestige occupational aspirations, relatively high SES, positive self-esteem, internal locus of control, and graduation from high school in a college-prep or academic program were predictive of a youth with a LD to attend a 2- or 4-year college or university (Rojewski, 1999).

Wagner et al. study found that youth with disabilities taking advanced math and foreign language coursework was related to attending postsecondary academic education. Although this was a positive finding, Cardoza and Rueda study found that white youth without LD were more likely to take advanced mathematics and science coursework, as compared to their white and Hispanic peers with LD.

As for educational track, both white and Hispanic youth with LD were more likely to be in general education or vocational track, while white youth without LD were more likely to be in college prep coursework (Cardoza & Rueda). Chen found that high school track was predictive of educational aspiration for youth with disabilities. Wagner et al. also found that GPA was slightly significant in predicting a youth with disabilities attendance in postsecondary academic education. Chen found her most significant predictor as the ACT composite score. Finally, Miller et al. (1990) found that youth with LD who attend postsecondary education were more likely to have higher IQ and achievement levels in reading and math than their peers with LD who did not attend postsecondary education.

Examining the school variables, Wagner et al. (1993) found that youth with disabilities who were attending schools with higher percentage of low income youth experienced similar outcomes than their peers without disabilities. An exception was that youth with disabilities attending a school with greater than 50% of the school population being low income were more likely to enroll in postsecondary academic programs than youth with disabilities coming from schools with a smaller percent of the school having low income students (Wagner, et al.). Wagner, et al. explains this finding could be due to scholarship programs or incentives provided to all students within these schools.

The rest of the findings from the studies that examined the aspirations and attendance of youth with disabilities in 2- or 4-year college or university are noted below. Youth with LD who participated in postsecondary education were more likely than their peers who did not attend to have been apart of any extracurricular activities during high school (Wagner, et al.). Youth with LD who participated in postsecondary education were more likely to have sought information from the following resources: vocational rehabilitation, representatives of the community college, and high school personnel (Miller, et al., 1990). In the follow-up study, Miller et al. (1991) found certain variables related to the type of postsecondary education a youth with LD decided and these variables were: talking to community college, talked with vocational rehabilitation, talked with other agencies, drive their own vehicle, other transportation, use city transportation, participate in industrial arts, participation in trades and industry, part of living expenses paid by student, and seeks help of friends for personal problems.

In addition, Wagner, et al. noted that youth with lower self-care skills were more likely to attend postsecondary academic education. When schools had contacted 2- or 4-

year colleges or universities on behalf of the youth, the youth with disabilities was more likely to enroll. Youth with disabilities who participated in school or community groups while in school were more likely to attend postsecondary academic education. While, Halpern et al. (1995) found that high scores on a functional achievement inventory, completing instructions successfully in certain relevant areas, participating in transition planning, parent satisfaction with instructions received by the student, student satisfaction with instruction received, and parent perception that the student no longer needed help in certain critical skill areas. Finally, Hitchings et al. (2005) found that interest in attending 4-year or community college among youth with disabilities decreases significantly during high school. In addition, only 5% of the youth with disabilities in junior year had taken the college prep coursework to attend a 4-year college or university.

Summary

The research base related to factors that predict or relate to college enrollment among youth with disabilities is a dated literature base lacking structure, with few studies comparing youth with and without disabilities. The first issue is the age of the research, given the rapid changes to IDEA in the last 17 years. In addition, the lack of structure or consistency between studies limits the research base, with the exception being the studies conducted by the same authors. Finally, the research is limited in its findings since more than half do not also look at youth without disabilities.

Regardless of the limitations, these studies do provide insight on what we know and what we do not know in the field. Income and parental influences were related to aspirations and attendance of youth with disabilities and that having a goal to attend postsecondary academic education was predictive of attendance. On the academic side,

college preparatory track, advanced coursework, and high GPA were shown to be related to aspiring and attending a 2- or 4-year college or university. Rojewski (1999) found that the academic variables that were predictive for youth without disabilities were also predictive for youth with LD. One study found school FARMS to be predictive of youth with disabilities plans to attend 2- or 4-year college or university (Wagner, et al.). The finding was the opposite of what was expected in the field.

What is not known is the extent of the influence the student, family and school level variables play in a youth's decision and attendance in higher education when compared to youth with disabilities, including the interaction of academic variables with having an IEP. Due to the limitations in the research that has examined youth with disabilities, it was important to review the research pertaining to youth without disabilities. However, this literature base is large and in order to examine the research that has studied the factors that predict youth enrollment in higher education, only the college choice literature was examined.

College Choice Literature in General Education

College choice is a very well established area of research, as well as outreach programs. There is a great deal of federal funding and non-profit institutions focused solely on improving the access to college, particularly among those students more likely to not enroll in college. This section provides an overview of the college choice literature, with a specific focus on the Hossler and Gallagher (1987) model of college choice and the variables in their model. This model looks at the entire process from a youth's development of educational aspiration to their attendance in higher education. This model also closes aligns with the purpose of the present study.

College Choice Models

Most of the research on college choice is focused on developing models that explain why some students attend college and not others, as well as examining predictors of college enrollment among particular groups of students (e.g., African Americans, female in STEMS [Science, Technology, Engineering or Math majors]). Over the last four decades four theoretical models have been developed to explain why some youth do not complete the path to higher education. The Hossler and Gallagher model is one of four theoretical models for considering how students get to college. The models all show that the path towards college is complicated with many variables interacting at varying points in the process. The Hossler and Gallagher Model consist of three stages: predisposition, search and choice (Hossler & Gallagher, 1987). Within this model, the path to college begins as early as seventh grade and continues through college enrollment. Research related to this model has generally studied youth who are on the path toward college attendance soon after high school and examines which students leave the path at the end of each stage (i.e., predisposition, search and choice).

In the Hossler and Gallagher three-stage model, the predisposition stage is when a youth decides that he or she aspires to continue their education after high school. The variables examined in this stage are student characteristics, influence of significant others (i.e., family and peers), educational activities, and school characteristics (Hossler & Gallagher, 1987). The search phase relates to the process of identifying and exploring 2- or 4-year colleges and universities of interest. The variables examined in this stage are student preliminary college value, student search activities, and college and university search activities. The final stage, choice, is the decision to apply to a specific

postsecondary education institution. The variables examined in the last stage are choice set and college and university courtship activities. These last two stages are influenced by recruitment efforts by colleges and the impact of cost and availability of financial aid as well as the factors that are important in the predisposition stage. The purpose of the present study was to examine the role of family, academic and school context variables on youths' with disabilities plans to attend a 2- or 4-year college or university. This purpose corresponds to the research related to the predisposition stage. Therefore, the research focusing on these variables was examined to inform the methods and analyses of the present study.

Research on College Choice

In this section, I review the research on college choice as it relates the variables in the predisposition stage. As noted above the variables that have been found to be important in developing aspirations to attend college are: student characteristics, influence of significant others, educational activities and school characteristics. One important consideration is the definition and/or interpretation of aspiration to attend college. Usually in the research, aspiration refers to the terminal degree (i.e., Associate, bachelor, or higher degree). Whereas, plans to attend college is usually related to the immediate next step in an individual student's education. In the following section, I review the literature that has looked aspirations. Later in this section, I review the literature regarding plans and discuss the choice of this variable for the present study.

Student characteristics. A number of student characteristics have been shown to relate to college choice. Overall, males, minorities and youth from low income households are less likely to attend higher education (Berkner & Chavez, 1997). In

particular, gender has been shown to be directly related to a youth's college aspiration (Hossler & Stage, 1992). In addition, race/ethnicity is indirectly related a youth's educational aspirations. For minority youth, the indirect relationship is countered by their participation in school activities and GPA (Hossler & Stage).

The importance of the development of education aspiration was shown in Cabrera and La Nasa study (2001). The study found that youth from low SES raised their chances by 28% of being minimally qualified for admission if they aspire for a bachelor's degree. Youth from low SES who aspired for an advanced degree were 34% more likely to apply to college than their peers who did not (Cabrera & La Nasa). In terms of a youth's plans or aspirations, when formed by 10th grade they are generally stable for youth without disabilities through 12th grade (Hossler, Schmit, & Vesper, 1999). Another study even went further to say that the educational aspirations of students in general education do not vary between 8th grade and 12th grade (Lakshmanan, 2004). Thus, early planning is important part of preparing youth to attend college.

Influence of significant others. Another risk factor for a youth in attending higher education is if neither of the parents have a college education (Berkner & Chavez, 1997). Researchers have found that parental influence can be indirect (e.g., parental education level) and direct (e.g., attitude, consistency, and support; Hossler & Stage, 1992). In terms of aspirations formation and the impact on college qualification, Cabrera & La Nasa (2001) showed that parental involvement and development of postsecondary plans in 8th grade resulted in an increase qualification for college admission in 12th. This relationship existed regardless of SES and ability (Cabrera & La Nasa).

Educational activities. In terms of educational activities, GPA and student activities (i.e., art, athletics, cultural events, student government) were found to directly relate to a youth's college aspiration (Hossler & Stage, 1992). Focusing specifically on academic activities, another factor shown to relate to college attendance is access to a college preparatory curriculum (Alexander, et al., 1987; Corwin, Colyar, & Tiernay, 2005). One problem with this line of research is that curriculum track is generally student reported and not always the most reliable measure (Lucas, 1999). However, even with that caveat, curriculum tracking is predictive of student postsecondary education attendance. Alexander et al. found that among youth with similar test scores, grades, race, and SES, and in different curriculum tracks (academic vs. non-academic); those on the academic curriculum track were more likely to go to higher education.

Specific research on coursework has placed a great deal of focus on math coursework. The Cabrera and La Nasa (2001) study found that college qualification index was highly correlated to the variable HIGHMATH. This variable was originally developed by Burkham and Lee (2003) as a means of evaluating math coursework beyond simply the number of credits a student took in math. Instead the HIGHMATH variable indicates the highest math course taken by a student and passed with credit. This assumes that students have successfully completed the prerequisite math coursework. Cabrera and La Nasa reported the HIGHMATH variable to be correlated college qualified variable at 0.72. This finding highlights the relationship between math coursework and access to higher education which has also been shown in other studies (Choy, Horn, Nunez, & Chen, 2000). That is, there is significant positive relationship between the highest level of math taken by a student and college attendance, regardless of

the level of the student's achievement in the courses. Since students must have an opportunity to take advanced math coursework, they must begin taking math courses early. Specifically, there is a relationship between taking algebra I in 8th grade and college enrollment. Taking Algebra I is also connected to parental education level (Choy, et al., 2000).

One source for the push with algebra I in 8th grade is from the National Council of Mathematics Teachers (NCTM) standards. Since there are no national curriculum, NCTM established standards in mathematics in order to provide guidelines on skills youth should be obtaining in school by grade bands. NCTM first set standards in 1989, updated again in 2000, the NCTM standards "describe the mathematical content that youth should learn to be successful…" (National Council of Teachers on Mathematics, n.d.). The standards are meant to serve as broad content areas which build upon each other over the entire schooling process, not specifically sequence of courses. In addition, the standards provide guidance on the development of courses through principals that have been shown to characteristics of good math instruction. As noted in the beginning of this paragraph, by following the NCTM standards a youth should be building the skills for algebra I from prekindergarten and by eight grade, the youth should have the background of algebra I even if they have not taken the formal class called algebra I in the 2000 standards update.

School characteristics. Research has shown a connection between the percentage of youth on free and reduced lunch (FARMS) in a school and availability of academic courses (Horn & Kojaku, 2001; Perna, 2005). For instance Horn and Kojaku found that among youth who completed a rigorous curricular program and enrolled in

four-year colleges or universities, 11% came from schools where more than 25% of the student body was on free and reduced lunch; whereas 27% of these youth attended high schools with fewer than 5% on free and reduced lunch. Anderson, Bowman, and Tinto (1972) study found that families living urban and suburban areas near a college or university raised the likelihood of a youth attending a college or university.

When the research has looked at school context and academic experiences, these analyses have been held at the student level (Perna, 2000; Valadez, 1998) and by not using multi-level model of analysis to examine experiences had by all students within similar schools the question of how schools impact college choice may be less evident.

In the next section, I discuss the college choice research around using different education aspirations or plans variable as an outcome variable for attendance and the limitation of these variables.

Plans to Attend College

In the present study, the dependent measure is plans to attend a 2- or 4-year college or university. The research has not established a clear distinction between aspirations to attend college and plans to attend. The relationship between educational aspirations, plans, and actual enrollment has been investigated in several studies. In particular, aspiration or plans in 12th grade have been found to be highly predictive of a youth attending a college or university (Adelman, 2006). Akerhielm, Berger, Hooker, and Wise (1999) also demonstrated that a youth's plan and his or her college attendance were highly correlated. However, Adelman (1999) noted that this finding may be artificially inflated due to the increased outreach to minority groups and females by specifically developed programs. Therefore the desire for a bachelor's degree has become more

universal among the high school population. In addition, attendance does not mean obtaining a degree. For example, one study reported that 31.5% of youth in 10th and 12th grade who reported aspiring to have a bachelor's degree had not obtained a bachelor's degree by the age of 30 (Adelman, 1999).

In terms of the present study, the dependent measure examines a youth's "expectation" of attending, this is meant to serve as a proxy to actual attendance. I also include students' aspirations to attend college in 10th grade as one of my variables predicting 12th grade plans to attend. Although the wording of the items in ELS:02 concerning aspirations vs. plans is different, it is not sufficient to conclude that aspiring to attend and planning to attend are independent of each other. Further, planning to attend is not the same as enrollment in college; therefore, the warnings and limitations stated by Adelman (1999) must be taken into consideration for the present study. This study can not extend beyond the youth's plans to attend and their actual enrollment and attendance of a 2- or 4-year college or university.

Summary

Research in the area of college choice provides a model for examining the process by which a youth decides to attend a 2- or 4-year college or university. An important finding of this review is that education aspirations are generally formed early and are fairly stable for youth without disabilities. In addition, parental involvement and early aspirations were related to being college qualified. Finally, mathematics was not only predictive of college attendance but also correlated to being college qualified. Although this research is more extensive, there are areas of the model that are underrepresented, including school characteristics and controlling for multilevel modeling.

CHAPTER III

Data and Methodology

The purpose of this study was two-fold. The first purpose of this study was to explore the differences between youth with disabilities on their plans to attend a 2- or 4-year college and compare those youth to their peers without disabilities who plan to attend a 2- or 4-year college or university. A second purpose was to identify the relative contribution of selected family, student, academic, and school contextual factors in predicting a student's plan to attend a 2- or 4-year college or university after graduation. In order to conduct this research, specific variables were selected from the first and second waves, including transcript data, of the ELS:02 database regarding the aspirations, academic opportunities and school characteristics of students with and without disabilities. These variables were then analyzed to determine their relative effects on students' plans to attend a 2- or 4- year college or university.

This chapter includes a description of the ELS:02 database including an overview of ELS:02, its purpose, design, sampling procedures, instrumentation, response rates, and the methods for identifying youth with disabilities in the sample. The chapter also describes the variables that were used in the study and provides a rationale for variable selection. Finally, the last section of this chapter discusses the methodology used to analyze the data.

ELS:02 Dataset

Overview and Purpose

The ELS:02 was funded by the U.S. Department of Education's National Center for Educational Statistics (NCES) to collect data from United States high schools. The

ELS:02 is a longitudinal study that began in school year 2001/02 and will continue for six plus years (the exact length has yet to be established). The ELS:02 is collecting a variety of data from a nationally representative sample of 15,362 10th graders who were enrolled in both public and private US high schools in 2001-2002 school year, their parents, and the youth's English and math teachers. The high schools attended by the 10th grade cohort are nationally representative of public and private high schools in the US in 2002, with some exclusions to be discussed later. In addition to the individuals noted above, data were also collected from the school administrator and library/media staff personal from each school in the sample, and a facility checklist was completed by an NCES representative. The data were collected in 2002, 2004, 2006 and one additional data collection is planned for 2008, when the cohort that was in 10th grade in 2002 will have been out of school 4 years (Ingels, Pratt, Rogers, Siegel, & Stutts, 2005).

The ELS:02 is the latest among a series of high school longitudinal cohort studies dating back to the 1970s (i.e., NLS-72, HS&B:80, & NELS:88). The goal of ELS:02 is to, "collect policy-relevant data about educational processes and outcomes, especially as such data pertained to student learning, predictors of dropping out, and high school effects on youth's access to, and success in, postsecondary education and the workforce" (Ingels, et al., 2005, p.7). The ELS:02 database allows for four levels of analysis: cross sectional, longitudinal, cross-cohort, and international comparisons. In the base year 2001/02, 17,591 10th graders enrolled in 752 public and private high schools were invited to complete the initial student questionnaire. Of the 17,591 10th graders, 15,362 youth participated in the student survey. These youth were considered the base-year sample. Among these, 163 youth were exempted due to barriers related to disability or limited

English proficiency (LEP). Youth were excluded if their IEP stated that they were not able to participate in testing and/or questionnaire completion. In addition, LEP youth were excluded if they had been taking English instruction for less than three years and the school staff did not feel the youth could complete the base-year English and Mathematic achievement tests or base-year student questionnaire. The school administrator, library media, and parent questionnaires were collected on these 163 youth and they were reassessed for participation in the first follow-up data collection in 2004.

Within the invited base year sample of 17,591, 1,031 were identified as having an IEP (including the 119 ineligible youth with disabilities only available in the restricted database). The ELS:02 collected information from these youth's IEPs and obtained their disability category from the school roster during sample selection. In addition, generic special education and disability questions were included in the student, parent, teacher questionnaires and transcript data. For instance, parents were asked, "In your opinion, does your tenth grader have a learning, physical, or emotional disability?" and "In your opinion, which of these disabilities does your tenth grader have?"

ELS:02 Research Design and Sampling Strategy

ELS: 02 used a two-stage sample selection process. High schools were selected from the 1999-2000 Common Core of Data (CCD) and 1999-2000 Private School Survey (PSS). The CCD is an annual national data collection effort by NCES which reports fiscal and non-fiscal data on all public schools in the United States. The PSS is a biannual data collection conducted by NCES on all private elementary and secondary schools in the United States. Prior to drawing the sample, the following secondary schools were excluded: high schools with no 10th grade, schools with no enrollment, ungraded schools,

Bureau of Indians Affair schools, special education schools, area vocational schools not enrolling youth directly, detention centers or corrections facilities, Department of Defense schools outside of United States, and closed public schools (closed private schools were not identifiable on PSS).

The remaining eligible high schools were selected based on probability proportional to size (PPS) of the school district within regions and metropolitan status. Within the CCD public schools are stratified into eight regions: New England/Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central; West South Central, Mountain, and Pacific. Within the PSS, private schools are stratified into 4 regions: Northeast; Midwest; South; and West. Within regions, schools are stratified by metropolitan status: urban, suburban, and rural. A total of 1,221 high schools were invited to participate, of which 752 agreed.

Once a school was selected, the principal of the school, the superintendent of the school district for the public schools, and the head of the Diocese for the Catholic schools was contacted by NCES staff and asked to participate. Upon agreeing to participate in the study, the school supplied NCES with a roster of 10th graders from that school. NCES then selected youth at random from each school's 10th grade roster. Hispanic and Asian youth were over sampled in the ELS:02, whereas youth with disabilities were not. In 2004, the sample was freshened to create a nationally representative sample of 12th graders in the United States High Schools. The freshened sample included youth who were not able to be included in the 2002 sample (e.g., youth not in 10th grade in 2002 or youth attending school outside of the United States). The freshened sample did not address the issue of attrition of youth between the base-year sample and the first follow-

up. Of the base year sample, 1,579 youth were lost (i.e., nonrespondents). One final note was that there was a subsample conducted of the base-year nonrespondents. Of the 2,229 nonrespondents of the base-year questionnaire, 1,000 were subsampled in the first follow up.

In the original study design, all participants in both the base year and first follow up were to have their transcripts collected from their school(s) which were then to be reviewed by contracting company of NCES and included as part of data collection. Between base year and first follow up, some youth had transferred schools and therefore multiple schools had to be contacted for a student's high school transcript. Not all youth who were in either or both base year and first follow up were sampled in the transcript collection. A total of 247 youth were not sampled because their transcripts could not be obtained. Of these, 224 youth were in schools that refused to participate in this part of the data collection and 23 eligible youth had noted in prior data collection that they personally did not wish to participate in the transcript data collection. Thus, ELS:02 researchers attempted to collect transcripts for 16,105 youth.

In order to obtain transcripts, the ELS:02 researchers contacted the school(s) (for youth who transferred to multiple high school during the base and first follow up) of each youth and requested their transcripts. Of the 2,032 high schools (759 high schools participated in base or first follow up and 1,273 transfer high schools) in the sample, 95 required that the youth or their parent/guardian sign a consent form to release the transcript. Consent forms were sent to 716 youth and only 181 consented to release their transcripts. An additional 671 youth in the sample did not meet the criteria of a transcript respondent. This included: (a) having at least one transcript and (b) having had at least

one complete course record for at least one grade (9th, 10th, 11th, or 12th). A course record included: course title; school year in which course was taken; grade level in which course was taken; school-assigned course credit; and standardized course grades. A total of 14,920 youth were included in the transcript study.

One last item to note, the ELS:02 database is available in two formats for both the base year and first follow up. There is a restricted and a public use data. The public use database does not contain information that will lead to identifying an individual student or school in the database. Certain variables are either deleted or collapsed into larger groups in the public database. In the restricted data, the deleted variables and original variables of the collapsed variables are made available. For instance, the race/ethnicity variable in the restricted dataset provides more choices, but due to the small N size in some categories, the likelihood of identifying individuals went up exponentially. The transcript data are only available through the restricted database; therefore I used the restricted data for this study.

ELS:02 Instrumentation

Data were collected from multiple sources across several years in order to provide a comprehensive examination of the experiences and outcomes of youth as they transitioned from high school towards adulthood. Data were collected from youth, teachers, parents, school administrative personnel, and librarians/media specialists. Additional information was obtained from a high school facility checklist and high school and college transcripts were reviewed at different points in time.

The following instruments were used: student questionnaires (base year and first follow up); parent questionnaire; teacher questionnaire; school administrator

questionnaire (base-year and first follow up); library media center questionnaire; school facilities checklist; base year reading and mathematics assessments; and first follow-up mathematics assessment. In this study, only the following instruments were used: student base year and first follow-up questionnaire, parent questionnaire, first follow-up school administrator questionnaire, and high school transcript. Table 5 indicates which data collection occurred during which years.

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Student questionnaires. All youth in the sample were administered the student questionnaire in the 2001/02 base year and again during the first follow up. A majority of the youth in the base year were administered the questionnaires in group settings in their schools. Those outside of school received a shortened version through a computer assisted telephone interview (CATI). This same shortened form was also translated into Spanish. The paper and pencil student questionnaire was only administered in English. There are seven sections in the student questionnaire: (a) locating information, (b) school experiences and activities, (c) plans for the future, (d) non-English use, (e) money and work, (f) family, and (g) beliefs and opinions about self.

During the first follow up there were seven types of student questionnaires: student questionnaire (administered to the original sample), dropout questionnaire, early graduation questionnaire, transfer student questionnaire, home school questionnaire, and new participant student questionnaire (NPSQ). This study used only those questionnaires completed by youth who were still in high school at the time of the first follow up. The

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first follow-up student questionnaire included eight sections: (a) future contact

information, (b) school experiences and activities, (c) how you spend your time, (d) plans

and expectations for the future, (e) education after high school, (f) work after high school,

(g) work for pay, and (h) community, family, and friends. The transfer questionnaire was

an abridged version of the student questionnaire with additional questions regarding the

student's reason for transferring.

Parent interviews. Parent interviews were to be completed by the parent or

guardian who knew the most about their young adult's school situation and experience.

The following methods were available for collecting information: CATI and hardcopy

questionnaires were used in order to capture the most parents in the database. In

addition, the parent survey was available in English and Spanish. The following five

topic areas were addressed in the parent survey: family background; their child's school

life; their child's family life; their opinions about their child's school; and their

aspirations and plans for their child's future. This data were only collected in the base

year.

School questionnaires. In the base year, the school administration questionnaire

included six areas: school characteristics; student characteristics; teaching staff

characteristics; school policies and programs; technology; and school governance and

climate. During the second follow-up, school administrators were questioned about the

following four areas: school characteristics, structure, and policies; student characteristics

and programs; teacher and library characteristics; and school environment.

High school transcripts. The high school transcript data were not collected as part

of the first follow up; rather they were collected between late 2004 and early 2005 after

the expected graduation of the cohort. All youth who completed at least one student questionnaire were included. The transcripts were collected from the base year school of the student and the last school they attended if they had transferred. For youth who were part of the senior freshening, transcripts were only collected from their last attended school. Incomplete transcripts were collected for those youth who had dropped out, who were not in the expected grade sequence, or who were going to be in school longer than their senior years due to special education services. Two types of incomplete transcript data were recorded. The first type was labeled "missing," which was due to school non-response to a transcript request or to incomplete record keeping. The second type of incomplete transcript data is labeled as "censored," and pertained to transcripts with less than 3-years worth of coursework because a student dropped out, graduated early, or transferred out to be home schooled.

Identifying Youth with Disabilities in ELS:02

During the initial recruitment of the sample, high schools were asked to provide a roster of the youth in 10th grade. In addition to their name, the roster includes race/ethnicity, sex, student ID, social security number and IEP status (i.e., student had an IEP), and type of disability. In previous high school longitudinal studies (e.g., HS&B, NELS:88), youth with disabilities "whose degree of disability was deemed by the school officials to make impractical or inadvisable to assess them" (Ingels, et al., 2005, p. 48) could be excluded from the sample. In ELS:02, a student with a disability could be excluded from the sample only when it was stated on the youth's IEP. The exclusion did not apply to a student who was unable to take the diagnostic tests in ELS:02 with accommodations, but could still complete the questionnaire. These individuals were

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included in the sample. Those who were unable to do both were classified as ineligible in base year.

In order to provide a greater number of youth with disabilities the opportunity to participate in ELS:02, accommodations were also provided for the reading and mathematics assessments. Accommodations included making alterations in test presentation, mode of response, setting, and allotted testing time. However, accommodations were only possible if the schools had the resources to provide them to the student.

Eligibility for all youth was reassessed between base year and first follow up. Some youth who were deemed ineligible were contacted to participate and some youth who were eligible during base year were found to be ineligible. For example, a youth with a disability who in 2002 may have been considered by an IEP team to only be unable to participate in an alternate assessment, could have been reassessed by the IEP team and considered eligible to participate in a general state assessment after 2002. The restricted database provides information on all youth found ineligible in both 2002 and 2004. In order to provide contextual information on the youth who were deemed ineligible to participate in the base year, ELS:02 linked these youth to the school level data (including school administrator information), collected questionnaires from the youth's parent and math and English teacher, and attempted to retrieve their high school transcripts. Information on those youth with disabilities who were deemed unable to complete the student questionnaire is available through the restricted database.

As noted earlier, questions regarding the identification of youth with disabilities are contained in the parent, student, teacher questionnaires, and transcripts as well as

from school rosters. However, questions posed in the parent, student, and teacher questionnaires are not desirable for identifying youth with disabilities who received special education services. For example, the student questionnaire only asks if the student had ever received special education services and the parent and teacher questionnaires begin with the question, "In your opinion, does your tenth grader have a learning, physical, or emotional disability?" which does not indicate whether a student is receiving special education or related services. Therefore, there are two more trustworthy means of identifying youth with disabilities in t he ELS:02 database. The first was through the IEP status variable which was collected from the school roster. This variable is IEPFLAG. The base year high schools were asked to report on the school roster "whether or not an individualized education program (IEP) was currently on file for the student (yes, no)" (Ingels et al., 2005, p.46). Using this variable excludes almost half the youth in the ELS:02 database because they are missing data.

The other means of identifying additional youth with disabilities who were missing data on IEP variable is through the transcript variable "Special Education/ Resource Room Curriculum Credit". The variable ranges from .05 to 22 credits. Listings of the courses included in this variable are available in Appendix B. This variable was included to increase the sample size of the youth with IEP and since only youth with IEP can receive special education services. There are two notes of caution. First, not all youth with IEPs take special education resource room for credits and secondly, youth identified under this variable may have exited special education prior to 10th grade.

Therefore, youth with disabilities in the analytical sample come from two groups. First, there are 537 youth with IEP identified under the IEP roster variable. Secondly,

another 375 youth with disabilities were identified under resource room variable. This provides a total of 912 youth with disabilities identified in the analytical sample.

Differences in the sample of youth with disabilities in my analytical sample were compared to other national databases of youth with disabilities in order to provide insight of issues in generalizing to the population. Unfortunately, due to the design of data collection, only those with IEPs identified under the roster variable reported the disability type. Therefore this analysis is limited to the 537 youth with IEPs. Among these 537 youth with IEPs, 388 were identified as having specific learning disabilities, 42 as having mental retardation, 28 as being emotionally disturbed, 25 had speech or language impairments, 24 had other health impairments, 12 had multiple disabilities, and fewer than 10 each cases in the following categories: hearing impairments, visual impairments, orthopedic impairment; autism; deaf/blindness; and other.

To provide some comparison of how this sub sample from ELS:02 compares to other special education samples, a comparison between the percentages of youth with IEPs in the ELS:02 sample to those included in the NLTS2 are presented in Table 6. The table also provides a comparison of the sample of youth by disability category in the ELS:02 database to the NLTS2 weighted data. Three differences appear in the comparison. First the proportions of youth with disabilities in ELS:02 are higher for youth with learning disabilities and speech and language than identified in NLTS2. In addition, the proportion of youth with disabilities in ELS:02 is smaller for youth with mental retardation than was found in NLTS2. These differences should be taken into consideration when generalizing the findings of my study.

INSERT TABLE 6 ABOUT HERE

For this study, only youth with disabilities who: (a) participated in both base year

and first follow up, (b) had identified their postsecondary education plans, (c) were still in

school during 2004 first follow-up data collection, (d) had parents who participated in the

study, (e) had school administrators complete their questionnaire, and (f) had transcript

data available were included in the study. Figure 1 and 2 provide visuals on how the final

student and school analytical sample was identified. Figure 1 begins with the panel

cohort, which are youth who participate in 10th and in 12th grade, followed by elimination

of cases by the above criteria. Figure 2 is based on the original 752 schools invited in

base year. Schools included in the study had to have at least one student from their school

in the analytical sample; those schools with no students in the database were dropped.

INSERT FIGURE 1 ABOUT HERE

INSERT FIGURE 2 ABOUT HERE

Variables

This section provides a review of the variables analyzed in this study. Before

providing an in-depth detail on each variable, it is important to note that the ELS:02 staff

used imputation to reduce the number of missing cases for certain variables. Sometimes

imputation was as straight forward as looking for the gender of the student as reported on the school roster when it was not reported by the student. On the other hand, some imputation used multiple variables to estimate the missing data for the chosen variable. Three types of imputation methods were employed by ELS:02 staff. These were: logical imputation, weighted sequential hot deck imputation, and multiple imputations. More information on these three methods can be found in *ELS:02: Base-year to first follow-up data file documentation*. For each variable below, the specific steps used to eliminate the missing data is described. In the following sections I describe both the dependent and independent variables for this study, including the data collection procedures.

Dependent Variables

There are two dependent variables is this study. The Postsecondary Plans after High School (F1PSEPLN) variable which was obtained from the first follow-up student, transfer, home school, and early graduate questionnaires will be used in research questions one and three. The original variable asked youth to identify their immediate postsecondary education plans in one of the following five categories: don't plan, don't know or planning unspecific, vocational/technical/trade school, 2-year community college, or 4-year college or university. The ELS:02 researchers imputed the data for youth who graduated early and were already attending a postsecondary education institution, but the type of institution is not identified. The variable was recoded a dichotomous variable with youth planning to attend a 2- or 4-year college or university coded as 1 and the rest of the youth in the sample coded as 0. There are two reasons for collapsing the data. First, the small number of youth with disabilities in the sample makes analyses of multiple categories difficult, if not impossible. In addition, this study is

concerned with examining the educational aspiration and secondary academic experiences of youth with and without disabilities as they relate to intentions to attend a 2- or 4-year college or university. Therefore, this purpose lends itself to the creation of the dichotomous variables. Furthermore, if youth did not respond to this item, they were excluded from the study.

The second dependent variable is only for research question two. This research question looks at the differences between youth with and without disabilities who plan to attend a 2- or 4-year college or university. Therefore the IEP is the dependent variable for this research question. The previous section provided an in depth discussion of how this variable was created.

Independent Student Level Variables

Race/ethnicity. In the ELS:02 restricted data, there are a number of variables that pertain to the general category of race/ethnicity. One is an imputed variable, BYRACE, created ELS:02 staff in order to eliminate missing data. The variable is called *student's race/ethnicity-composite* variable. In the ELS:02 dataset, missing race/ethnicity data were imputed. Race/ethnicity was first obtained from the student base-year questionnaire. For those youth with missing data on the variable, the following methods were used to identify the student's race, such as data reported on the sampling roster or parent questionnaire and if missing data on these documents, the variable was logically imputed using surname or native language. Eight categories of race/ethnicity are reported: American Indian/Alaska Native; Asian; Hawaii/Pacific Islander; Black or African American; Hispanic/no race specified; Hispanic/race specified; Multiracial; and White. Due to the small sample sizes in some of these categories for the sub sample of youth

with IEPs, the variable was recoded and collapsed from eight categories into four: White; Hispanic (race and no race specified); Black or African American; and Other.

Socioeconomic status 2. This composite variable, BYSES2, was created in the ELS:02 and is based on five equally weighted and standardized variables: father's/guardian's education; mother's/guardian's education; family income; father's/guardian's occupation; and mother's/guardian's occupation. Occupational prestige scores were defined using the 1989 General Social Study (GSS) listings. The scores range from -2.11 to 1.98. The scores go from lowest to highest SES. The variable remained a continuous variable. In order to provide easy interpretation of the BYSES2 results, the variable was z-scored prior to running any analysis.

Parental education. This composite variable, BYPARED, is based on two items taken from the parent questionnaire. The parent questionnaire asked the following, "What is the <u>highest level</u> of education you or your spouse/partner have reached?" The respondent was to provide information on themselves and than their spouse, therefore providing two answers. There were nine possible responses: don't know; less than high school; graduated high school or GED; attended 2-year school, no degree; graduated from 2-year school; attended college, no degree; graduated from college; completed master's or equivalent; and completed PhD, MD, other advanced degree. The individual with the highest degree was coded in this variable. If the data were missing from the parent questionnaire, the highest parent education level was recorded from the student questionnaire. If neither the parent or student questionnaire contained data on this item, a weighted sequential hot deck imputation was used.

Since I investigated the impact of being a first generation college student on the plans of youth with disabilities to attend a 2- or 4-year college or university, I created a dichotomous variable to address this. Parents who attended at least some college were coded 1 and parents with high school degree or less were coded 0.

Student Characteristics

Gender. This base year dichotomous variable, BYSEX, was developed by ELS:02. This variable was taken from the base year student questionnaire and when data were missing, ELS:02 first substituted data from the school roster, and then employed logical imputation based on student name. Females were coded 0 and males were coded 1.

Youth's educational aspiration. The original variable was taken from the 10th grade student survey asking the youth, "As things stand now, how far in school do you think you will get". The response options were: I don't know; less than high school; graduated high school or GED; attended 2-year school, no degree; graduated from 2-year school; attended college, no degree; graduated from college; completed master's or equivalent; and completed PhD, MD, other advanced degree. To remove any missing values, ELS:02 researchers used an imputation procedure and created the new variable BYSTEXP. Since "I don't know" was a possible answer on the survey, this value was retained in the new variable. In a review of the variable in the ELS:02 technical manuals, almost 9% of the entire ELS:02 sample indicated that they did not know their postsecondary educational plans in 10th grade. These youth were retained in the study, by collapsing the variable into a three-level multinomial variable: those who aspire to attend

a 2-year college or more will be coded as 3, those indicating a high school degree or less will be coded as 2, and those who did not know in 10th grade coded as 1.

     Parents' expectations for their child. This variable, BYPARASP, was taken from the parent questionnaire question which asks, "how far in school do you <u>want</u> your tenth grader to go". There were eight response options: Don't know; less than high school graduation; high school graduation or GED only; attend or complete 2-year school course in a community or vocational school; attend college, but not complete 4-year degree; graduated from college; obtain master's degree or equivalent; and obtain PhD, MD, other advanced degree. All missing data for this variable were imputed using the weighted sequential hot deck imputation. A binary variable was created in which parents' expectation of 2-year college or greater would be coded 1 and all other responses coded 0.

     Disability status. This variable is the combination of two variables, BYIEPFLG and F1R54_C. BYIEPFLG variable was recorded from the school roster during the sample selection and was used to identify the youth who had an IEP. In the database, this variable is coded as 1 for youth with an IEP and 0 for a youth without an IEP. As noted previously, about half of the youth in this database were missing this variable from the entire sample in the ELS:02 database. This variable was only collected in base year and only applies to youth who were identified in the 10th grade cohort. In order to identify additional youth with disabilities in the ELS:02 database, the variable F154_C was included in the study. This variable reported the number of courses taken by youth in high school that were special education resource room courses. The variable was a continuous variable, ranging 0.05 to 22 credits. This variable was recoded as a

dichotomous variable, where by those who have taken any credit in special education resource room were recoded 1 and those who had not were recoded 0. A new variable was created where by youth who's IEP status remain the sample and those students who had missing data on the BYIEPFLG variable but had taken credit under F154_C were also identified in the variable as having a disability.

School Experiences

　　Math pipeline. The composite variable, F1RMAPIP, created by ELS:02 represents the highest non-zero credit math course completed by a student. This variable was originally constructed by Burkam and Lee (2003) as part of the NELS:88 working paper series. The MATHPIPE8 variable is defined by 47 high school math courses collapsed into eight levels which was proven to (a) be associated to achievement on other measures and (b) is normally disturbed. In addition, the NELS:88 study showed that the variable was strongly related to certain background variables (social and academic variables). The selection of where the cut was placed between categories was not fully explained or demonstrated in the working paper.

　　In the ELS:02 study, information about math courses were taken from a student's last available high school transcript. Math courses were categorized into one of eight categories: no math; non-academic; low-academic; middle academic; middle academic II; Advance I; Advance II/Pre-Calculus; and Advance III/Calculus. Table 7 provides the break down of how the math courses were assigned to the eight categories. The variable was intended to be use as a continuous variable and this is how it remained the study.

INSERT TABLE 7 ABOUT HERE

High school program track. The variable, BYSCHPRG, was taken from the base

year student survey, which asked, "If you had to limit yourself to one of the following

three, which comes closest to your high school program?" The three options were:

vocational, general, and college preparatory. All missing data were imputed. ELS:02 did

not provide further documentation about what it means to be in a particular track, such

as describing or listing coursework. For question three, this question was made binary

for ease of interpretation, 0= general education and 1= college preparatory track.

GPA. The student's academic GPA variable was taken from the high school

transcript .The ELS:02 had supplied the cumulative GPA reported in the youth high

school transcripts, unfortunately slightly less than 2,000 of the youth were missing this

variable from the entire sample. Another option was to use one of the multiple GPA

variables. The options were: 9th Grade GPA Courses; 9th Grade Academic GPA Courses;

10th Grade GPA Courses, 10th Grade Academic GPA Courses; 11th Grade GPA Courses;

11th Grade Academic GPA Courses; 12th Grade Courses; 12th Grade GPA academic

courses; GPA for all courses; GPA for all academic courses; GPA for all academic

courses, honors weighted; GPA for all academic courses, failed courses excluded. In

terms of academic work, the GPA for all academic courses, honors weighted was seen as

the best option. It focused on the main academic subject coursework, included failed

courses and weighted the honor courses. The variable is called F1RAGN. Grades

received for academic coursework were placed on a 0-5.0 scale. For more information on

the development of the GPA variables, see *ELS:02 First Follow-up Transcript Data.*

Table 8 provides the ELS:02 conversion from GPA into the letter grades.

INSERT TABLE 8 ABOUT HERE

School-Level Variables

Percent free and reduced lunch (FARMS). This variable is taken from the base-year school administrator questionnaire. The administrators were asked "percent of the current tenth grade youth receiving free and reduced-price lunch from your school". This question was an open ended question. The BY10FLP variable in the ELS:02 data set recoded the responses into the following categories: 0 - 5%; 6 - 20%; 11 - 20%; 21 - 30%; 31 - 50%; 51 - 75%; and 76 - 100%. Sixty-seven schools of the 752 base-year schools had missing data on the % FARMS data. Further explanation of imputation on this variable is discussed under missing data section within this chapter.

Urbanicity. This variable, BYURBAN was obtained from the CCD and PSS data files. The variable identifies whether the school is located in an urban, suburban, or rural area of the country. There are no missing data associated with this variable.

Methodology

Sampling Weights

Sampling weights are designed to allow the researcher to report the results of analyses as reflective of a population instead of the sample. Since the ELS:02 database is a multi-level sample scheme which oversampled certain student groups (i.e., Hispanics

and Asians), the applied weights properly reflect the number of youth in the population that the sample is intended to represent.

In ELS:02, sampling weights are applied at two levels. First, student level weights were calculated. Multiple student-level weights were developed including: (a) cross-sectional weights to be representative of all 10th graders in American high schools in 2002, (b) cross-sectional weights designed to be representative of all 12th graders in American high schools in 2004, (c) cross-sectional weights designed for the restricted dataset that included the expanded sample of youth who were ineligible in 10th grade, but who did complete some or all of the student questionnaire in 12th grade, (d) a first follow-up panel weight for those youth who completed some or all of both base year and first follow-up, (e) a first follow-up panel weight with the expanded sample which is only available on the restricted dataset, (f) a cross-sectional transcript weight for the sample of youth in first follow-up and who have transcript data which are only available on the restricted dataset, and (g) a panel transcript weight for the sample of youth who have either fully or partially completed the student questionnaire in base year and first follow-up, and who have transcript data. This last weight is also only available in the restricted database. School level data were also weighted based on the 2002 data.

For this study, the sampling weights were chosen based on the unit of analysis. For the first two questions, the variables are weighted at the student level. In the third question, both student- and school-level weights are applied. This study used base year, first follow up and transcript data; therefore the appropriate student-level weight variable was F1PLNWT. This weight is a longitudinal weight which was calculated on only youth who partially or fully completed the student questionnaire in base year and first follow up

and who had transcript data (N= 14,713). For the school level variables, only schools that had at least one student in the school in the student level sample were included in question three and therefore the weight BYSCHWT was applied.

Missing Data

Most of the variables in this study had been imputed by ELS:02 researchers to remove missing data. However, the variables with missing data are: plans; GPA; and percent free and reduced lunch. In ELS:02 there can be several different reasons that data are missing. Many of the surveys had skip patterns which resulted in certain youth, parents, or school staff not responding to some items. Respondents may refuse to answer a question or only partially answer a question. Each of these forms of missing data means something different and requires consideration for how to address potential biases. In ELS:02 there is a universal coding system for the different types of missing data. This includes: (-1) "I don't know", (-2) "Refused", (-3) "Item legitimate skip/NA", (-4) "nonrespondent", (-5) "out of range", (-6) "multiple responses", (-7) "Partial interview-breakoff", (-8) "survey component legitimate skip/NA", and (-9) "missing."

The "don't know" code applies to variables that had the option to reply in that category. "Refused" is noted for individuals who refused to answer any question during the CATI interviews or on critical questions on the hardcopy questionnaire. "Item legitimate skip/NA" is missing due to the skip patterns which had routed the respondent away from that particular question due to an answer on a prior question. The "nonrespondent" code is reserved for student and school variables, since there are multiple data collection points. This code applies to those youth or schools who did not complete that questionnaire from which the variable was drawn. "Out of Range" is a code

applied to open-ended questions which were above the reasonable limit that would apply to the variable. The "multiple responses" code applied to non-CATI items for which the respondent filled out multiple answers when the question only required one response. "Partial interview-breakoff" was a code to note when the respondent either did not wish to continue, or in timed sessions when the time had run out. "Survey component legitimate skip/NA" refers to survey components that do not apply to that student. Finally, "Missing" refers to questions not answered by the individual generally by accident through misunderstanding the routing procedures on the hardcopy.

In this study, the missing data only applies to the following two independent variables: GPA at the student level and % FARMS at the school level both of which had missing data. Once the student level sample was reduced due to the selection criteria, only three students were missing data on GPA. Therefore listwise deletion was chosen to handle these cases. Listwise deletion consists of deleting the cases with missing data associated with the variables used in specific analyses (Alison, 2002).

To run HLM software there cannot be any missing data at the school level. Therefore, it is critical to use one form of imputation to eliminate missing data and retain as many of schools in the sample. Of the original 752 schools, 67 schools were missing data on the FARMS variable. In examining the database, the school administrators had also completed the data on FARMS in first follow up. I decided to impute the missing data based on FARMS reported in the first follow up. After imputing data, there were still 10 missing cases. In examining the ELS:02 database there were variables taken from CCD 2002/2003 for the school FARMS. I imputed the data for the missing cases and reducing the missing cases four. Than taking the data from CCD 2001/2002 FARMS

variable in the ELS:02 database, it reduced the missing cases to three. Finally, two of the

three schools had data on percent minority and by taking the correctional means of the

different FARMS category with of the percent minority variable. This reduced the

missing cases to one. To address the final missing case, the mean of the Urbanicity

variable was used in order to impute the FARMS data.

One last note on missing data, due to the large number of cases dropped from the

study due to the missing IEP variable, a non-bias report analysis was considered

appropriate. The non-bias report compared the dropped sample to the analytical sample

using chi-squares and t-test, depending on the variable. In addition, frequencies and

percents were reported between the baseline sample (i.e., panel sample) and the analytical

sample. This study analyzed the following variables in both non-bias analyses: gender,

race/ethnicity, SES, parental education, school locale and percent of free and reduced

lunch. The result from this analysis highlights which groups are over or underrepresented

in this study and what generalizations can and cannot be made from the results of the

analysis of my analytical subsample.

Analyses

Two types of analyses were conducted this study. First, exploratory descriptive

and statistical analyses were conducted for questions one and two of this study. The

second was Hierarchical Generalized Linear Modeling (HGLM) for question three

(Raudenbush & Bryk, 2002) to examine the influence of student-level and school-level

variables on the plans to attend a 2-or4- year college or university among youth with and

without disabilities. A description of both types of analyses is provided below.

Exploratory descriptive analysis. To answer Research Questions 1 and 2, frequency and row percents were calculated for each variable. In addition chi-square analyses were conducted for each of the categorical variables and t-tests for the continuous variables in three categories (i.e., demographics, student characteristics, and secondary experiences) using the sample of youth with disabilities and the dependent variable of plans to attend (question one). The same analyses were used to answer question 2 except that the sample included both youth with and without disabilities. Due to the nature of the school level variables and the role of these variables in the study, the variables were used to answer only research question 3 only. Research question 1 and 2 are listed below:

Research Question 1: What are the differences between youth with IEPs who plan to attend a 2- or 4-year college and those youth with IEPs who do not plan to attend on the following 10th and 12th grade ELS:02 variables: (a) demographics (i.e., race/ethnicity, SES, parental education), (b) student characteristics (i.e., gender, educational aspiration, parental expectation), and (c) secondary experiences (i.e., high school academic coursework, math pipeline, GPA.

Research Question 2: How do youth with IEPs who plan to attend a 2- or 4-year college or university compare to youth without disabilities who plan to attend a 2- or 4-year college or university on the following 10th and 12th grade ELS:02 variables: (a) demographics (i.e., race/ethnicity, SES, parental education), (b) student characteristics (i.e., gender, educational aspiration, parental expectation), and (c) secondary experiences (i.e., high school academic coursework, math pipeline, GPA).

In order to address research question 1, the analytical subsample was restricted to youth with disabilities only with the weights normalized within SPSS for the student level variables. Prior to applying the weights, the weights were re-normalized to youth with disabilities only. Youth with disabilities who plan to attend versus those who do not plan to attend a 2- or 4-year college or university were assessed on each of the independent variables. To answer research question 2, I compared youth with disabilities who plan to attend a 2- or 4-year college or university to their peers without disabilities who plan to attend a 2- or 4-year college or university on all of the independent variables. For each question, visual depictions of the relationships among the variables are presented in Appendix A.

The chi-square test was chosen to analyze question one and two, since it is designed to analyze dichotomous or categorical variables. The test provides the researcher the opportunity to establish if there is a difference between the groups based on the observed and what the expected frequency is. As with any statistical test there are restrictions of using chi-square test and they are:(a) Chi-square can be used only with frequency data, (b) chi-square requires that   an individual events or measures are independent of each other, (c) no theoretical frequency should be smaller than 5, (d) there must be some logical or empirical basis for the way the data are categorical, (e) the sum expected and the sum of the observed frequencies must be the same, and (f) the algebraic sum of the discrepancies between the observed and the corresponding expected frequencies will be zero (Isaac & Michael, 1997, p. 185).

For the first research question, the null hypothesis was applied to each independent variable within: demographics, student characteristics, and secondary

experiences. The significance level was set at .05 prior to the Bonferroni correction. For significant chi-squares, follow-up pairwise chi-squares were conducted. In addition standardized residuals [R] were run to evaluate the difference between the expected frequency and the observed frequency and Cramer's V was used to evaluate the strength of association. Standardized residuals that are greater than 2.00 or less than-2.00 identify cells that are contributing to significant chi-squares. The following guidelines are suggested for interpreting Cramer's V: greater than 0.5 is considered a high association, 0.3 to 0.5 is considered a moderate association, 0.1 to 0.3 is considered a low association, and 0 to 0.1 is considered to be little to no association (Crewson, 2006).

As for the three continuous variables; GPA, Math Pipeline, and SES, a t-test was used to test for significance. Significance was set at .05. A two sample independent t-test provides the statistical means for evaluating the differences between group means in research questions 1 and 2 on these three independent variables. Due to the fact that multiple t-tests were performed on the independent variables, a Bonferroni correction was applied.

HGLM analysis. To answer Research Question 3, I used HGLM.

Research Question 3: Which school academic experiences and school context variables predict whether a student with and without an IEP has a plan in 12th grade to attend a 2- or 4-year college or university and do the factors differ between the two groups of youth?

The decision to use HGLM is based on the nature of the sample. The procedure accounts for the fact that youth are nested within schools, and therefore, some of their experiences are shared by all of the youth within that school. For example, a student's

family income is experienced by that student and the members of the household but the percent of youth on free and reduced lunch within the school will be experienced by all of the youth regardless of individual household income. HGLM attempts to account for this problem with two- or three-level nested models.

In order to account for the nesting effect of youth within schools (as is the case in this study), two equations are modeled (one at level-1 and level-2). At each level the sub-model expresses the relationship between the variables in the equation and how those variables influence the model at another level (Raudenbush & Bryk, 2002). Since the outcome variable (PLANS) is binary (1 = plans to attend 2- or 4-year college or university, 0 = does not plan to 2- or 4-year college or university) the distribution is non-linear. Therefore, HGLM with Bernoulli sampling model and logit link which allows for binary outcomes was the appropriate analyses. In the rest of this section I discuss: (a) the means of interpreting the results of the HGLM output, (b) issues over variance estimates (overdispersion and underdispersion), (c) differences between various forms of output (unit vs. population-average), (d) using bivariate correlation matrix, and (e) the aspects of the HGLM model (unconditional and conditional model), including decisions over centering and fixing the independent variables in the model. Before I move into this discussion, it should be noted that when I discuss unit specific model, population-average model, unconditional, and conditional model, I am referring to different aspects of HGLM.

The statistical output of the HGLM analysis is log odds. Log odds allow the researcher to talk about results in terms of a normal distribution, since it is not bound by

the parameters of probability. Statistical analysis using probability restricts the limits of analysis from 0 to 1.

Another feature of HGLM is the ability to identify over-dispersion or under-dispersion, which occurs when the variance is larger or smaller than what would be expected. Over-dispersion could be due to influential outliers with one or more of the independent level-1 (student level) variables or under-dispersion of the model could be influenced by the exclusion of one or more important independent variables (Luke, 2004). The HLM 6.03 application allows the user to examine if over-dispersion or under-dispersion existed in specified conditional model. In terms of interpretation, the closer to 1 the HGLM output provides in the fully conditional model, the better the specification of the model. Although there are no stated rules on what is considered to be under-dispersion or over-dispersion, it is up to the researcher to note this output and how it relates to the model and the interpretation. In this study, the dispersion remained around 1.0 through the four models.

Another decision that must be made prior to running the HGLM analyses is whether to use the population-average or the unit-specific model. The unit specific model is the more complex model to interpret, but provides a more precise estimate of the fully conditional model. This model is used for research questions that deal with changes in school (level-2) variables and how these changes impact each school's means. Although the unit-specific model will provide greater level of detail, it is done with greater number of assumptions than the population-average. The population-average model is designed to answer questions related to population averages. By design, the population-average model is a more robust model with fewer assumptions to violate. Given the unequal

sample size of my dependent variable; it would be safer to use the population-average

model output in evaluating the results.

Prior to running the actual model, which consisted of multiple conditional models,

I also conducted a bivariate correlational matrix analysis with the independent and

dependent variables separately at the student and school level. This allowed me to

evaluate the correlation among the variables and to drop any variables from the HGLM

analysis that are highly correlated with another variable. Variables correlated at 0.6 or

above were considered highly correlated and evaluated to their importance to remain in

the model.

Prior to this point, I noted all the issues to be considered to design and understand

the output from the HGLM model (i.e., over-dispersion, unit vs. population-average

model). Now I discuss the actual models that are reported. To build the conditional

model, I specified the variables entered at different levels to evaluate the impact of the

new variables on the dependent variable and the IEP. The first conditional model

specifies the outcome variable [PLANS] and IEP as the level-1 predictor. This

conditional model determined if IEP was a significant in predicting the outcome variable

[PLANS]. The conditional model with only the IEP status represented in the equation is

represented below in Equation 1.

Equation 1

Conditional Model: IEP only

Level 1: η_{ij} (plans) $= \beta_{0j} + \beta_{1j} + r_{0j}$

Level 2: $B_{0j} = \gamma_{00} + u_{0j}$

$\eta_{ij}=$ Log of the odds of success
$\beta_{0j}=$ Level-1 one coefficient
$\beta_{1j}=$ Level-1 one coefficient, IEP
$r_{0j}=$ level-1 random effect (error term)
$\gamma_{00}=$ level-2 coefficient
$u_{0j}=$ level-2 random effect (error term)

The second model examined the academic variables (i.e., GPA, Math pipeline, Coursework) on the youth with disabilities plans to attend and the IEP variable. The third model examined the student and family characteristics (i.e., parental aspiration, parental education, gender, SES, race/ethnicity) on the previous model. Finally at level-2, school level variables (i.e., FARMS and Urbanicity) were entered into the model.

In specifying the fully conditional model, two decisions were made about each of the independent variables at level-1 and level-2. First was centering. Centering of the variables in HGLM provides a reference point for interpreting the results of the study. This technique is similar to using dummy coding or z-scoring variables in order to provide a standardized reference to interpret the results. There are three types of centering that can be used at level-1 of the model: grand mean centering, group mean centering, and leaving the variable in its natural metric. Grand mean centering places the mean of the variable around the mean of all the variables in the dataset, while group mean centering places the mean of the independent variable at each individual level-2 unit (i.e., the mean of each school). At level-2 of the conditional model, the choice of centering is either to grand mean center the independent variable or leave the independent variable at

its natural state. In the study, level-1 variables were grand mean centered unless the variable was centered in SPSS. For level-2, both variables were grand mean centered.

Interactions are the examination of the effect of two independent variables on the outcome variable. Interactions can be specified within the HGLM model. Since the main focus of this study was to examine differences between youth with and without disabilities, running interactions with IEP status and other independent variables of interest was appropriate. The following independent variables were examined for an interaction with IEP status in the HGLM model: IEP status and High School Coursework, IEP status and Math Pipeline, and IEP status and GPA. Both the math pipeline and high school track did not have significant interactions.

Finally, in order to evaluate the impacts of schools prior to model 4, the between school variance is examined in the model. At each level, including the unconditional model, the between school variance and its significance level was examined to determine if and when certain student level variables reduced the between school variance.

Proposed Statistical Software for Conducting Analysis

The SPSS 15.0 software program (SPSS Inc., 2006) was used to store the database, run the non bias reports and conduct the analysis of question one and two. The third research question employed the HLM 6.0 software program (Raudenbush, Bryk, & Congdon, 2005). This software allowed for two- and three-level modeling of data.

Summary

This chapter provided a detailed description of the methods in answering the three research questions. The ELS:02 database, due to the inclusion of youth with and without

disabilities in the sample, was used for this analysis. From this database, the variable

PLANS was identified as the dependent variable. In addition, the following variables

were identified as the independent variable: race/ethnicity, SES, parental education,

gender, educational aspiration, parental expectation, IEP status, high school academic

coursework, math pipeline, GPA, Urbanicity, and FARMS. In order the answer question

one and two, percents, chi-squares and t-test analysis was conducted using the SPSS

software. Finally, question three was analyzed using HGLM fully conditional model with

HLM software.

CHAPTER IV

Analyses and Findings

The purpose of this study was two-fold. The first purpose of this study was to

explore the differences between youth with disabilities on their plans to attend a 2- or 4-

year college and compare those youth to their peers without disabilities who plan to

attend a 2- or 4-year college or university. In addition, a second purpose was to identify

the relative contribution of the selected family, student, academic, and school contextual

factors in predicting a student's plan to attend a 2- or 4-year college or university after

graduation. In order to accomplish this, variables were selected from the first and second

waves of the ELS:02 database, including the transcript data.

This chapter presents the findings related to each of the research questions. They

are:

Research Question 1: What are the differences between youth with IEPs who plan

to attend a 2- or 4-year college and those youth with IEPs who do not plan to attend on

the following 10th and 12th grade ELS:02 variables: (a) demographics (i.e., race/ethnicity,

SES, parental education), (b) student characteristics (i.e., gender, educational aspiration,

parental expectation), and (c) secondary experiences (i.e., high school academic

coursework, math pipeline, GPA).

Research Question 2: How do youth with IEPs who plan to attend a 2- or 4-year

college or university compare to youth without disabilities who plan to attend a 2- or 4-

year college or university on the following 10th and 12th grade ELS:02 variables:

(a) demographics (i.e., race/ethnicity, SES, parental education), (b) student characteristics

(i.e., gender, educational aspiration, parental expectation), and (c) secondary experiences (i.e, high school academic coursework, math pipeline, GPA).

Research Question 3: Which youth academic experiences and school context variables predict whether a youth with and without an IEP has a plan to attend a 2- or 4-year college or university in 12th grade and do these factors differ between the two groups of youth?

Prior to conducting my analyses to answer the research questions, a detailed non-bias analysis was conducted between the baseline sample, dropped cases and the analytical sample at the student and school levels. The non-bias analysis evaluates the parameters of generalizability of the analytical sample. Following my discussion of the generalizability of the analytical sample, the results from the first research question will be presented. For both the first and second research questions I report frequencies, row percents followed by the results of the t-tests and chi-square analyses. The third research question required use of HGLM analysis and those results will be presented as well as the bivariate correlations among student and school level variables.

Non-bias Analysis

In order to determine whether the analytical sample might be biased, two non-bias reports were conducted at both the student and school level. The non-bias analyses is important because a large number of cases had to be dropped from the analyses due to missing data on key variables, most notably IEP status. The first analysis was a comparison between the dropped cases and the analytical cases using chi-squares and t-test. The second was a comparison between the original baseline or full sample and the analytical sample. The non-bias analyses used the following variables: gender,

race/ethnicity, parental education, and SES. Table 9 presents the results of the chi-squares and t-tests comparisons of the analytical sample (n= 4,818) and the dropped cases (n= 9,895). As noted in the table, there was a statistically significant difference ($p < .01$) in terms of race/ethnicity and parental education between the dropped cases and analytical sample. The analytical sample contained more students who were white and fewer students with parents without any college education. There was also a tendency for dropped cases to have slightly lower SES values, though the magnitude of the difference was small (-0.04 SD)

INSERT TABLE 9 ABOUT HERE

The second non-bias analysis compared the baseline or full sample (n= 14, 713) to the analytical sample (n= 4,818). The same variables were used in the analysis as in the previous analysis. Table 10 contains the results of these analyses, which indicate that despite the large number of dropped cases, the parameters of generalizability for the analytic sample are similar to the parameters for the baseline or full sample. There was a slight difference between the baseline and analytical samples in terms of race/ethnicity. White youth are overrepresented (5% difference) in the analytical sample, whereas Hispanic (6% difference), African American (8% difference), and Other (4% difference) are underrepresented. All other variables are comparable (within 2% difference or 0.02 SD).

INSERT TABLE 10 ABOUT HERE

A non-bias analysis was also conducted on the school-level variables of Urbanicity and % FARMS. These variables were only used in the HGLM analysis. Table 11 indicates that there was a statistically significant difference (p<.01) on the Urbanicity and % FARMS variables between the dropped cases and analytical sample. In addition, the results of the follow-up pairwise chi-squares conducted on the Urbanicity variable indicated that there were statistically significant differences (p<.05) between urban, suburban, and rural locale. Suburban and rural schools were more likely to be included in the analytical sample than would be expected of data missing at random.

INSERT TABLE 11 ABOUT HERE

In addition to examining the differences between the dropped cases and analytical sample, the differences between baseline and analytical samples were also examined. Table 12 shows that, in comparison to the baseline sample, suburban and rural schools were overrepresented in the analytical sample (11% and 32% difference respectively), while urban schools were underrepresented (10% difference). Finally, the mean % FARMS was slightly higher for the analytical sample as compared to the baseline sample (approximately one third of a standard deviation).

INSERT TABLE 12 ABOUT HERE

Results from this non-bias analyses indicate that caution should be exercised when interpreting any results related to race/ethnicity of students and both Urbanicity and

FARMS variables at the school level. The bias in the analytical sample suggests that the results may be skewed to schools from suburban and rural areas that serve more economically advantaged families. The next section will report the results for the first research question.

Characteristics of the Analytical Sample

Prior to addressing the research questions, frequency and percentages were calculated for all youth in the analytical sample on the following variables: gender, race/ethnicity, SES, parental education, and parental expectation for their child. Table 13 shows the frequency and percent of youth with and without disabilities on the selected variables. The results show that youth with disabilities in the analytical sample are more likely to be males and members of minority groups, specifically African Americans, Hispanics, and Others. Also youth with disabilities are more likely to have parents who have no college education and parents who do not aspire for their child to attend a college or university. Further, the mean SES for youth with disabilities was -0.22 and the mean SES for youth without disabilities was 0.11 indicating that youth with disabilities were on average from families with lower SES than their peers without disabilities.

INSERT TABLE 13 ABOUT HERE

Finally, Table 14 shows how youth with and without disabilities compared on their educational plans (column percents). Youth with disabilities were less likely to plan to attend a 2- or 4-year college than their peers without disabilities (16% difference).

INSERT TABLE 14 ABOUT HERE

Research Question One

Research Question 1: What are the differences between youth with IEPs who plan to attend a 2- or 4-year college and those youth with IEPs who do not plan to attend on the following 10th and 12th grade ELS:02 variables: (a) demographics (i.e., race/ethnicity, SES, parental education), (b) student characteristics (i.e., gender, educational aspiration, parental expectation), and (c) secondary experiences (i.e., high school academic coursework, math pipeline, GPA).

To answer question one, youth with disabilities who planned and did not plan to attend a 2- or 4-year college or university were compared on the following variables: race/ethnicity, SES, parental education, gender, educational aspiration, parental expectation, high school academic coursework, math pipeline, and GPA. Table 15 provides the frequencies, percents and chi-square analyses of the student level variables. In order to interpret the results within Table 15, the expected percentage of youth who plan and do not plan to attend a 2- or 4-year college or university was calculated to compare to the observed percentage. In addition, standard residuals were computed and are reported with the corresponding text. For interpretation, standard residuals greater than 2.0 or less than -2.0 identify the cell(s) that is causing the chi-square to be significant.

Gender, 10th grade aspirations, parental expectation and high school track were found to be significant between the expected and observed frequency for youth with

disabilities who plan and do not plan to attend a 2- or 4-year college or university. Females planned to attend 2- or 4-year colleges or universities more often than would be expected (standardized residual [R] = 2.3). In terms of youth 10th grade aspirations, youth with disabilities who aspired to attend a 2- or 4-year college in 10th grade were more likely to have plans to attend in 12th grade (R = 2.3) and youth with disabilities who did not aspire to attend 2- or 4-year college or university in 10th grade were more likely to not plan to attend in 12th grade (R = 5.1). Youth with disabilities who did not know their educational aspirations in 10th also, grade were less likely to plan to attend a 2- or 4-year college in 12th grade (R = 2.3). Youth with disabilities whose parents did not aspire for them to have a college education were less likely to plan to attend a 2- or 4-year college or university (R= -2.3).

Finally, in terms of academic track, youth with disabilities who reported being in a college preparatory/academic track were more likely to plan to attend a 2- or 4-year college or university (R= 2.0), whereas those youth with disabilities who reported being in a vocational track were more likely to not plan to attend a 2- or 4-year college or university (R = 3.1). No differences in the proportions of youth with disabilities who planned to attend or not attend a 2- or 4-year college or university were found on the race/ethnicity or parental education variables.

INSERT TABLE 15 ABOUT HERE

For those variables with more than two categories (i.e., Gender, 10th grade aspirations, parental expectation and high school track) that were found to be significant,

follow up pairwise chi-square analyses were conducted. Strength of association was calculated for all significant categorical variables (Cramer's V). To interpret the Cramer's V results, 0.5 or above is considered to be high association, 0.3 to 0.5 is considered a moderate association, 0.1 to 0.3 is considered a low association, and 0 to 0.1 is considered to indicate little to no association. Table 16 presents the results of the pairwise chi-squares and Cramer's V. In terms of 10th grade aspirations, the strongest associations were found between the proportion of youth with disabilities who planned and did not plan to attend a 2- or 4- year college and their reported curricular track (Cramer's V= .23) and their 10th grade reported aspirations (Cramer's V= .26). These associations show that educational aspirations of college or less than college were related to 12th grade plans to attend college. In addition, high school track (college prep vs. vocational track) was related to a youth with disabilities plans in 12th grade.

INSERT TABLE 16 ABOUT HERE

T-tests were then performed to determine differences between the two groups on the following variables: SES, GPA, and Math pipeline. Table 17 shows that there were significant differences between the two groups on all three variables. Those youth with disabilities planning to attend 2- or 4-year college or university had a higher average SES, were taking middle academic math and had a higher GPA than their peers with disabilities who did not plan to attend a 2- or 4-year college or university in 12th grade. The differences for SES and Math pipeline are relatively large, equating to nearly one half and three quarters of a standard deviation, respectively.

INSERT TABLE 17 ABOUT HERE

Figure 3 provides a visual comparison between those youth with disabilities who plan and do not plan to attend a 2- or 4-year college or university in terms of math pipeline. One can see that a greater percentage (45%) of youth with disabilities who do plan to attend a 2- or 4-year college or university have taken middle academic II math and above (i.e., Algebra II). By comparison, only about one fifth of youth with disabilities who do not plan to attend a 2- or 4-year college or university took comparable college preparatory math courses.

INSERT FIGURE 3 ABOUT HERE

Research Question Two

Research Question 2: How do youth with IEPs who plan to attend a 2- or 4-year college or university compare to youth without disabilities who plan to attend a 2- or 4-year college or university on the following 10th and 12th grade ELS:02 variables:
(a) demographics (i.e., race/ethnicity, SES, parental education), (b) student characteristics (i.e., gender, educational aspiration, parental expectation), and (c) secondary experiences (i.e, high school academic coursework, math pipeline, GPA).

To answer question two, youth with disabilities who plan to attend a 2- or 4-year college or university were compared to youth without disabilities who also planned to attend a 2- or 4-year college or university on the following variables: race/ethnicity, SES,

parental education, gender, educational aspiration, parental expectation, high school

academic coursework, math pipeline, and GPA. Table 18 provides the frequencies, row

percents and results of chi-squares analyses. In order to interrupt the results in Table 18,

the expected percentage of youth with and without disabilities planning to attend a 2- or

4-year college or university was compared to the observed percentage. In addition,

standard residuals were computed and are reported with the corresponding text. For

interpretation, standard residuals greater than 2.0 or less than -2.0 identify the cell(s) that

is causing the chi-square to be significant.

Gender, race/ethnicity, and parental education, youth's aspiration in 10th grade,

parental aspirations and high school track were found to significantly differ from

expected frequency. Youth with disabilities who planned to attend 2- or 4-year college or

university were more likely to be males (R= 3.0), less likely to be white (R= -3.8) and

more likely to be Hispanic (R = 3.5) and African American (R= 4.1). Youth with

disabilities who plan to attend a 2- or 4-year college or university were more likely to

have parents with no college education (R = 3.8) as well as parents who expected their

child to have less than a college education (R = 4.3).

In terms of 10th grade educational aspirations, youth with disabilities who aspired

to attend a college or university in 10th grade were less likely than expected to indicate

plans to attend college at 12th grade (R = -2.8) and more likely be overrepresented in

aspiring for less than college in 10th grade (R= -10.1). Finally, in terms of academic track,

youth with disabilities who planned to attend a 2- or 4-year college or university reported

being in college preparatory/academic track less often than expected (R= -4.2), and in

vocational track more often than expected (R = 3.7).

INSERT TABLE 18 ABOUT HERE

For those variables with more than two categories of what say

(i.e., Race/ethnicity, 10th grade aspirations, and high school track) that were found to be

significant, follow up pairwise chi-square analyses were conducted. Strength of

association was calculated for the all significant categorical variables (Cramer's V). To

interpret the Cramer's V results, 0.5 or above is considered high, 0.3 to 0.5 is considered

moderate association, 0.1 to 0.3 is considered a low association, and 0 to 0.1 is

considered to be little to no association.. Table 19 presents the results of the pairwise chi-

squares and Cramer's V. In terms of race/ethnicity, the pairwise comparisons between

white youth and African American, Hispanic and Other were significant. There were also

significant differences between all three comparison for youth with and without

disabilities on 10th grade aspirations and significant differences between two comparisons

on curricular groups (i.e., General Education vs. College Prep, College Prep. vs.

Vocational). The differences observed were significant ($p<0.05$). The strongest

association was between the proportions of youth with and without disabilities who

planned to attend a 2- or 4-year college or university and their 10th grade aspirations

(between don't know and less than college; Cramer's V= .29).

INSERT TABLE 19 ABOUT HERE

T-tests were then performed to determine the significance of the differences between the planned and not planned to attend college groups on the following variables: SES, GPA, and Math pipeline. Table 20 shows that there were significant differences between groups for each of the three variables. Those youth with disabilities planning to attend a 2- or 4-year college or university had lower SES, were taking middle academic math, and had a lower GPA than their peers without disabilities.

INSERT TABLE 20 ABOUT HERE

Finally, Figure 4 provides a visual examination of the differences between youth with and without disabilities who plan to attend a 2- or 4-year college or university. The largest percentage of youth with disabilities (35%) reported taking middle whereas youth without disabilities were more evenly divided among the upper math pipeline categories. Slightly more than 67% of youth without disabilities have taken Algebra II or above in the mathematical sequence compared to less than 50% of youth with disabilities.

INSERT FIGURE 4 ABOUT HERE

Research Question Three

Research Question 3: Which youth academic experiences and school context variables predict whether a youth with and without an IEP has a plan to attend a 2- or 4-year college or university in 12th grade and do these factors differ between the two groups of youth?

Bivariate correlations were conducted on all independent and dependent variables at the student and school levels to determine the relationship among the variables to decide if a variable needed to be dropped from the analysis due to multicollinearity to hyphenate Table 21 shows the student level bivariate correlation matrix. There are two highly correlated variables: math pipeline and GPA were correlated at .63 indicating that students with higher GPAs were also more likely to take higher level math courses. In Chapter 3, I discussed dropping variables that were correlated at .60 or higher. However, since GPA and Math Pipeline are important variables in this study I retained them in my HGLM analysis despite the possibility that one might obscure the effect of the other. At the school level, the correlation between Urbanicity and FARMS was -0.01 which did not warrant any concerns about using these variables in the HGLM model.

INSERT TABLE 21 ABOUT HERE

The HGLM analyses examined four models. The first model examined the impact of the IEP variable on plans to attend a 2- or 4-year college or university. The second model assessed the contribution of the academic variables on a youth's plans to attend and the third model added the student and family characteristics. Finally, the school level variables were added to the full model.

Table 22 provides the results of the four models. The results are reported as log odds which mean the coefficients are not bound between 0 and 1, as is the case with probability. In the first model IEP was found to be a significant negative predictor of a youth's plans to attend college. That is, youth with disabilities were less likely to plan to

attend a 2- or 4-year college or university. In model two, academic factors (i.e., GPA, Math pipeline and high school track) and selected interaction terms (i.e., GPA and IEP) were added into the equation. These were all significant. Math pipeline, GPA and high school track were positively related to a youth's plans to attend 2- or 4-year college or university. In other words, as a youth's GPA or Math pipeline increased or if they were in college preparatory-academic track, the log odds that they would plan to attend a 2- or 4-year college or university also increased. The interaction term for GPA and IEP was also significant but negative. This means that as GPA increased, the log odds of a youth with an IEP planning to attend 2- or 4-year college or university decreased. As compared to their peers without an IEP, the effect of GPA on plans to attend college or university was weaker for youth with disabilities. The following family and student variables were then added to the model: parental education, parental expectation, race/ethnicity, SES and gender. The SES and African American and Hispanic characteristics were significant and positive. That is, when holding everything else constant (i.e., math pipeline, high school track, GPA, SES, gender, parent education and parent expectation), the log odds of African American and Hispanics planning to attend a 2- or 4-year college or university was greater than their white peers. Being male was significant and negatively related to a youth's plan to attend a 2- or 4-year college or university. Neither parental education nor parental aspiration had a significant effect. The final model added the two school level variables (i.e., Urbanicity and FARMS). Of these, only attending an urban school had a significant positive impact on youth's plans to attend a 2- or 4-year college or university.

Prior to adding the school level variables to the equation, the differences between schools were evaluated on the variance component at the intercept between the

unconditional model, model 1, model 2, and model 3. This comparison allows one to evaluate if there was any variance left between schools when entering each block of student level variables in the models (i.e., IEP status, academic variables, and family and student background). The unconditional model specifies your dependent variable and no independent variables so that a researcher may evaluate the amount of variance between and within schools that is left to be explained. With each new model, the addition of student level variables (i.e., GPA, race/ethnicity) accounted for some of the difference between schools. Table 23 shows that there were significant differences between schools in the unconditional model, model 1, and model 2. In model 3, which specified student and family variables, the difference between schools became non-significant. This means that most of the variance between schools was explained away by the average student and family characteristics, therefore making the differences between schools in the probability of planning to attend a 2- or 4-year college or university non-significant.

INSERT TABLE 22 ABOUT HERE

INSERT TABLE 23 ABOUT HERE

In this last model, the interaction between GPA and IEP remained significant and negative. This means that as a youth's GPA increased the probability that a youth with an IEP would plan to attend 2- or 4-year college or university was less than their peers without an IEP. Although when a youth's GPA decreased, the probability that a youth

with an IEP would plan to attend a 2- or 4-year college or university was greater than their peers without disabilities. To provide a visual representation of this interaction, Figure 5 GPA was allowed to vary between plus and minus one standard deviation in log odds. When examining the slopes, the effect of GPA on a youth without an IEP plans to attend a 2- or 4-year college or university is steeper than for youth with an IEP, therefore demonstrating that GPA has little impact on a youth with disabilities educational plans. Where as for youth without an IEP, having a high or low GPA shows plays a large role in a youth's plans to attend or not attend a 2- or 4-year college or university.

INSERT FIGURE 5 ABOUT HERE

Summary

In summary, youth with disabilities in the ELS:02 database who reported planning to attend a 2- or 4-year college or university were more likely to be female, from families with higher SES, and to have parents who are college educated and aspire for their child to go to college than youth with disabilities who do not have such plans. In addition, youth with disabilities planning to attend college have taken higher level math courses, have higher GPAs and more likely to report being in a college preparatory-academic track.

When comparing this group of youth with disabilities to their peers without disabilities who also plan to attend a 2- or 4-year college or university, the youth in the former group were more likely to be male, minority, come from families of lower SES, have parents with no college education and to be less likely to have aspirations to attend

college in 10th grade. In addition, the youth with disabilities did not take courses that were as far along on the math pipeline, had lower GPAs, and were less likely to be in a college preparatory-academic track. In other words, while these youth with disabilities indicated the same plans as their peers without disabilities, they remain significantly disadvantaged. Research question three demonstrated that academic track, GPA, and Math pipeline accounted for some of the effect of having an IEP when entered in model two. Only GPA had a significant interaction with IEP, which meant that GPA had a limited effect on the 12th grade plans of youth with disabilities. There was no interaction were found between IEP with math pipeline and high school track. Race/ethnicity, SES, and gender still mattered for all youth in their plans to attend a 2- or 4-year college or university. Finally, after considering the effects of academic, family, and student characteristics, there was still a difference in the probability that youth with disabilities will plan to attend a 2- or 4-year college or university as compared to their peers without disabilities.

CHAPTER V

Discussion

This study utilized data taken from the first and second waves, including transcript data, of the ELS:02 database to examine the differences between youth with disabilities who plan and do not plan to attend a 2- or 4-year college as well as to compare youth with and without disabilities who plan to attend a 2- or 4-year college or university. In addition, the study also attempted to identify the relative contribution of the selected family, student, and school contextual factors in predicting a student's plan to attend a 2- or 4-year college or university after graduation.

This chapter includes a discussion of the overall findings and the implication of these findings on policy for youth with disabilities, and recommendations for future research. This chapter is divided into the following sections: (a) discussion of the findings using the framework of Hossler and Gallagher Model (1987) predisposition stage, and (b) discussion of the findings for policy and future research.

Findings in Relation to Hossler and Gallagher's Model

The results of the study showed that youth with disabilities who plan to attend a 2- or 4-year college are neither like their peers with disabilities who do not plan to attend nor are they like their peers without disabilities who plan to attend. I discuss my findings as they relate to previous research related to the four areas in the predisposition stage of the Hossler and Gallagher Model which I introduced in Chapter 1 and which captures the major areas of interest in my study including, (a) student characteristics, (b) influence of significant others, (c) educational activities, and (d) school characteristics. I chose to explore the variables in each of these three categories across my research question so I

could gain a better perspective of how youth with disabilities who planned to attend a 2- or 4-year college or university compared others (i.e., youth with disabilities who did not plan to attend and youth with disabilities who did plan to attend 2- or 4-year college or university).

In research question one and two, the independent variables were grouped into three categories including demographics, student characteristics, and secondary experiences. The final research question also added the school characteristic variables. I will discuss the implications of my findings in terms of the Hossler and Gallagher model.

Student Characteristics

In the present study, the following student characteristics were examined: gender, race/ethnicity, SES, IEP and educational aspirations. All of these variables except for 10th grade educational aspirations were also examined in the HGLM models. In all the HGLM models, having an IEP reduced the probability of planning to attend a 2- or 4-year college or university regardless of other student and family characteristics, academic experiences, and high school context entered into the equation.

In the general education literature on college choice, certain groups of youth are less likely to go on to higher education. These include males, minorities (specifically African Americans and Hispanics), and from individual households of lower SES (Berkner & Chavez, 1997). In the special education literature, youth with disabilities are more likely to be overrepresented in these categories (Marder, et al., 2003). In the present study, youth with disabilities who planned to attend a 2- or 4-year college or university were overrepresented in all three of these groups at-risk of not attending higher education. This is not necessarily surprising since males, African Americans and

Hispanics, and youth who come from a low SES family are already more likely to be receiving special education as compared to their peers without disabilities (Marder, et al.).

When examining the HGLM results, being a male youth with or without disabilities was significantly and negatively associated with planning to attend college at 12th grade. This finding is supported by the general education literature which shows that females are more likely to attend college (Berkner & Chavez, 1997). In addition, the SES variable was significant and positively related to planning to attend college in the HGLM analysis, which is also supported by general education literature that indicates that coming from a family with higher SES is predictive of college attendance (Berkner & Chavez, 1997) and studies in special education that have found that higher SES or family income relate to attending higher education (Chen, 2004; Rojewski, 1999; Wagner, et al., 1993).

In the HGLM analysis, the race/ethnicity variables of African American and Hispanic were significant and positive in the models. At first this may appear to be a surprising finding given that the general education literature shows African American and Hispanics are less likely to go to college (Berkner & Chavez, 1997). A possible explanation is the way in which I created the analytical sample (i.e., youth who were still in high school in 12th grade and who had not transferred high schools between 10th and 12th grade). Thus, it is possible that those African American and Hispanic students who remained in the analyses tended to differ from peers of the same race and ethnicity in terms of GPA or math coursework taken. Therefore, the African American and Hispanic youths may have had greater motivation to attend college and to consider higher

education as the next step after high school even more than a comparable group of white youth.

In terms of educational aspirations, 76.7% of youth with disabilities who aspired to attend a 2- or 4-year college or university in 10th grade still planned to attend in 12th grade. This compares to 88.6% among youth without disabilities which was found in a previous study (Adelman, 2002). These findings provide evidence that both youth with and without disabilities form aspirations to attain postsecondary degrees early and that a majority of them sustain their aspirations over time. However, among youth with disabilities who indicated that they did not plan to attend, nearly half changed their minds in 12th grade. Although, this finding is proportionally higher than expected based on observed proportion of the sample, youth with disabilities in the current study experienced less stability in their postschool aspirations and appeared to increase their aspirations during the last two years of high school.

In previous research conducted with students with disabilities, educational aspirations were found to be lower for youth with disabilities compared to their peers without disabilities (Rojewski, 1996; White, et al., 1983). The aspirations even differed between youth with disabilities who are White and Hispanic (Cardoza & Rueda, 1986). However, previous research has not explored how stable the aspirations were for youth with disabilities during high school, research has shown that the educational aspirations of youth without disabilities are relatively stable from early high school to the end of high school (Hossler, Schmit, & Vesper, 1999; Lakshmanan, 2004). This finding is particularly interesting in light of the fact that youth with disabilities must develop post-school goals by age 16 as part of the transition planning requirements in their IEPs under

IDEA 2004. There has been little attention paid to how early goal setting relates to later outcomes. In fact, currently, policymakers are concerned mainly with measuring students' postschool outcomes rather than determining how goals or aspirations might vary in secondary school and which factors might increase or maintain student aspirations.

Influence of Significant Others

In the general education literature, parental education and expectation that their son or daughter would attend college has been related to a youth's educational aspiration and college attendance (Berkner & Chavez, 1997; Hossler & Stage, 1992). However, in the present study, parental education and expectations were not significant in the HGLM models. This finding may be due to the parental education and expectation variable which was highly skewed in the database and did not create enough variance to predict differences in postsecondary plans. For example, only 182 of 4,818 parents (3.8%) expected their son or daughter would not attend a 2- or 4-year college or university.. Youth with disabilities whose parents did not expect them to attend college were overrepresented in the category of not planning to attend a 2- or 4-year college or university. This finding supports previous research which showed that youth with disabilities whose parents aspired for them to have a college education were more likely to attend (Wagner, et al., 1993). However, when comparing parents of youth with disabilities to those without disabilities, the parents of youth with disabilities who planned to attend a 2- or 4-year college or university were less likely to aspire for their child to have a college education.

Educational Activities

In the HGLM models, higher GPA, higher math pipeline, and reporting being on college preparatory track were positively associated to a youth's plans to attend a 2- or 4-year college or university. Although GPA was a predictor for all students the effect of GPA was weaker for youth with IEP than for youth without an IEP. A similar interaction was not found for math pipeline and being in a college preparatory track for youth with disabilities; this means that with every increase on the math pipeline, youth with disabilities increased their chances of planning to attend a 2- or 4-year college or university at the same rate as their peers without disabilities. In terms of high school track, being in a college preparatory track had the same effect on youth with a disability as it did on their peers without disabilities in terms of planning to attend a 2- or 4-year college or university

The finding of the impact of academic experiences on youth with disabilities plans to attend 2- or 4-year college or university is important given that increasing academic rigor is something that can be addressed by schools and policy makers. The special education and general education literature supports the influence of math pipeline and high school academic track on college attendance (Alexander, et al., 1987; Cardoza & Rueda, 1986; Chen, 2004; Choy, et al., 2000; Corwin, et al., 2005; Rojewski, 1999; Wagner, et al., 1993).The also literature notes that youth without disabilities reach higher levels of math coursework than youth with learning disabilities (Cardoza & Rueda, 1986). However, my study went further by noting that youth with disabilities who planned to attend a 2- or 4-year college or university did not move as far along the math pipeline as their peers without disabilities (middle academic math vs. middle academic

math II). Since the math pipeline has been equated to being minimally qualified for higher education (Cabrera & La Nasa, 2001), the fact that youth with disabilities did not on average reach the same level on the math pipeline raises questions about these students' ability to be granted admission to a college and universities and to be successful in higher education.

Beyond taking advanced math coursework, some studies involving youth with disabilities have identified that having a higher GPA predicts enrollment in higher education (Rojewski, 1999; Wagner, et al., 1993). In particular, Rojewski's (1999) study showed that high-prestige occupational aspirations, relatively high SES, positive self-esteem, internal locus of control, graduation from a high school college-preparatory or academic program, and high GPA all predict enrollment in higher education for youth without disabilities as well as for youth with learning disabilities. The present study found GPA to be a significant and positive predictor of planning to attend, but the impact of GPA was not the same for youth with and without disabilities. The GPA of youth with disabilities had less of an effect on educational plans to attend or not to attend a 2- or 4-year college or university. The finding highlights some issues with GPA and its role in determining postsecondary plans for youth with disabilities. For example, one possible reason for this disconnect between high GPA and educational plans is that youth with a disability are not taking the same level of advanced coursework in high school. Therefore receiving an A in Algebra I in 12th grade is not the same as receiving an A in pre-calculus in 12th grade.

School Characteristics

The findings from this study demonstrated that youth without disabilities attending an urban high school were more likely to attend a 2- or 4-year college or university. The research in special education has shown that being in a school with higher percent of youth receiving FARMS was related to a youth attending postsecondary academic education, specifically a 2- or 4-year college or university (Wagner, et al. 1993). The present study did not find that a relation between the percentage of students receiving FARMS in a high school and an individual youth's plans. However, this could be explained by the fact that SES was accounted for at the student level and therefore did not leave enough variance to be explained between groups.

Implications for Policy and Research

There are a number of implications for policy that can be taken from this study. For instance, research in college choice has found that youth without disabilities form their aspiration between 8th and 10th grade and that these aspirations remain stable through the end of high school (Hossler, Schmit, & Vesper, 1999; Lakshman, 2004). In the present study, 76.7% of youth with disabilities who planned to attend a 2- or 4-year college or university in the 12th grade had similar aspirations in the 10th grade. The early development and stability of a youth's educational aspirations provides a rationale for developing a course of study, as required in IDEA 2004 prior to age 16 and is further supported in the general education literature (Hossler, et al.; Lakshman) that it occurs no later than the 8th grade.

Developing the course of study prior to high school will provide youth with disabilities the best opportunity to take prerequisite courses that are required to enter higher education (e.g., advanced math coursework). It also informs the students and their families on the minimum qualifications (e.g., coursework) needed for admission to a 2- and 4-year colleges or university in enough time to plan appropriately with guidance counselors and the IEP team. As noted in the general education literature, youth whose parents had expectations for them to attend a 4-year college or university in the 8th grade were more likely to meet the minimum qualification for admission at a 4-year college or university by 12th, regardless of SES and ability (Cabrera & La Nasa, 2001

Future Research

Historically, youth with disabilities have not attended college at the same rate as their peers without disabilities (Wagner, et al., 2005). This gap also remains evident in the present study with a 16% difference. This consistent finding over time may indicate that postsecondary outcomes need to be examined from a different perspective. For example, we know that students with disabilities are more likely to be from families with lower SES, from minority groups, and have parents who have not attended college. Therefore, it would be more appropriate to compare postsecondary outcomes by subgroups (e.g., SES, race/ethnicity, and parental education). Examining the data on differences in college attendance within these categories for youth with and without disabilities will help identify were specific support and resources may need to be directed.

Given the limited and dated research regarding youth with disabilities and postsecondary education, this study was exploratory in using nationally represented

database. The results of this study provide a basis for additional research in the field especially in terms of examining the difference between youth with and without disabilities. Given the cautions within general education literature on equating plans to attend with college attendance, future research should examine which youth with disabilities who plan to attend a 2 or 4-year college or university in the 12th grade actually enroll within the first two years of leaving high school. At the present time, we have no data that examines the link between expressed goals for postsecondary education and actual entrance into college. The IDEA 2004 mandates that states collect data on 20 indicators for youth with disabilities (e.g., dropout rate) to report to the US Department of Education. One indicator, Indicator 13, requires data to be collected concerning students with disabilities measurable postschool outcomes (e.g., employment) one year after leaving high school (Regional Resource & Federal Center Network, 2008, retrieved from http://www.rrfcnetwork.org/content/view/248/358/.). This could provide an opportunity for further exploring the link between aspiration and actual enrollment. Since the majority of the special education studies on educational aspirations and college attendance have been conducted with youth with LD, future research should look at youth with other types of disabilities, such as youth with LD. Also, since youth within a specific category of disability can be very heterogeneous, it would appropriate in the future to focus on more specific characteristics within groups of youth with disabilities to evaluate difference in plans and attendance rates as related to academic experiences. Due to the limited sample size of youth with disabilities (n= 912), restricting the sample to only youth with LD the sample (n= 338) would fall to low for meaningful results.

In addition, this study also examined math courseworksince it has been considered the gateway to higher education (Cabrera and LaNasa, 2001). Just as this study found that taking advance math courses increased the probability that a youth with a disability would plan to attend college, future research should also examine other courses and indicators of college readiness. This includes meeting the academic as well as other admission requirements for 2- vs. 4-year colleges.

Due to this design of the study and limitations due to sample size at both the student and school level, the results were very limited with respect to characteristics of schools and how they impact a youth's plans. Future research should examine the impact that different schools have on a youth's postschool plans and enrollment in higher education. Specially, we need to better understand how schools differ on their influence on youth with disabilities and their postschool outcomes and address the question; does access to specific courses and supports mute the effects of disability status on postsecondary attendance across all schools or only in certain schools?

Finally, future research should examine the differences between students who attend a 2-or 4-year college or university. Again, due to the sample size, examination of differences between youth with disabilities planning to attend a 2- versus a 4-year college or university was not explored. Research has shown a greater number of youth with disabilities go to 2-year colleges immediately after high school (Newman, 2005). Thus, we need to investigate factors that may predict enrollment in four-year colleges in order to increase the number of youth with disabilities who enroll and succeed in these higher education institutions.

Summary

The present study examined the difference between youth with disabilities on their plans to attend and not to attend a 2- or 4-year college or university. In addition, it offered a comparison to youth without disabilities who planned to attend 2- or 4-year college or university. The results of the study showed that youth with disabilities who plan to attend a 2- or 4-year college are neither like their peers with disabilities who do not plan nor are they like their peers without disabilities who also plan to attend. They are more likely to be males, minorities and to come from families with lower SES and parental expectations than their peers without disabilities who plan to attend 2- or 4-year college or university. The students with IEPs are also likely to be less well prepared academically. Nonetheless, these students did plan to go onto college or universities and future research can examine those who do attend among this sample in ELS:02.

This study contributed to our understanding of factors that might impact a student's plans to enroll in higher education. First, GPA had less of an effect for youth with IEPs than their peers without disabilities. However, taking higher level math courses was equally predictive of a youth's plans, regardless of whether the student had an IEP. Clearly, youth with disabilities must be given every opportunity take higher level math coursework, beginning in middle school and early in high school. Finally, over three fourths of the youth with disabilities who aspired for a college education in 10th grade maintained those aspirations through spring of 12th grade, showing both the stability and importance of early aspiration development. These findings should encourage new consideration about when to begin planning a course of study for youth with disabilities.

It is my recommendation that policy makers require the course of study to be designed in relation to transition services before ninth grade.

TABLES

Table 1

Description of Purposes of the Studies

Citation	Description of Purpose
White, Deshler, Schumaker, Warner, Alley, & Clark (1983)	Provide descriptive information on adult adjustment (including participation in postsecondary education) between youth with and without learning disabilities
Cardoza & Rueda (1986)	Compare the educational expectations of Hispanic youth with disabilities, Caucasian youth with disabilities, and Caucasian youth without disabilities to examine the impact of ethnicity versus disabilities on outcomes (i.e., attended college, worked after high school, earned income if working full-time, completed high school, dropout out of high school).
Miller, Snider & Rzonca (1990)	Examine the relationship between factors, such as extracurricular activities or math achievement scores and the decision of youth with learning disabilities to participate in postsecondary education (i.e, 4-year college, junior college, vocational education, military, etc.).
Miller, Rzonca & Snider (1991)	Examine the factors that relate to the type of postsecondary education chosen (e.g., two- vs. four-year college or university) among youth with learning disabilities.

Wagner, Blackorby, Cameto, & Newman (1993)	Identify the experiences in high school (e.g., school characteristics, instructional time) that help youth with disabilities meet their goals postschool outcomes, including postsecondary academic education.
Halpern, Yovanoff, Doren, & Benz (1995)	Explore the predictors (e.g., gender, parental expectations, student GPA) of participation in postsecondary education (i.e., community college, 4-year college or university, etc.) by high school youth with disabilities in Oregon, Nevada, and Arizona.
Rojewski (1996)	Compare the differences in occupational and educational aspirations between youth with and without learning disabilities and across gender in high school.
Rojewski (1999)	Examine the outcomes (i.e., completion of high school and education/work status 2-years postschool) of youth with and without learning disabilities two years after high school and find the predictive value of selected variables obtained from participants in grade 12.
Chen (2004)	Identify educational goals and vocational preferences for youth with disabilities, identify the needs of high school youth with disabilities in counseling and educational guidance, and investigate the effects of certain factors on educational aspirations and vocational choices.

Hitchings, Retish, & Horvath (2005)	Examine the core academic preparation of youth with disabilities and their transition postschool goals to attend higher education and the planning process at the IEP.

Table 2

Nationally Representative Data Sets

Name	Sample	Data Collection	Data Collection Timeline
High School and Beyond (HS&B)	Stratified Random Sample of U.S high school Sophomores (30,000) and Senior (12,000) in 1980	Surveys of Youth, Parents, parents, teacher, and school officials, High school Transcripts, and Battery of tests in: Vocabulary, Reading, Math, Science, Writing, Civics Education, Postsecondary Education Transcripts	1980, 1982, 1984, 1986, 1992
National Educational Longitudinal Study of 1988 (NELS:88)	Stratified Random Sample of U.S 8th graders in 1988: 25,000	Surveys: Student, 2 teachers, Parent, School administration, high school transcripts, Reading and Math tests	1988, 1990, 1992, 1994, 2000

| National Longitudinal Transition Study (NLTS) | Stratified Random Sample of youth with disabilities between the age of 15- 23 in 1985/1986: 8,000 | Survey of student, parent, teachers, school administrator, School program, high school transcripts | 1987, 1990, 1993 |

Table 3

Descriptions of Special Education Studies Samples

Citation	Data Source	Data Selection	Sample HS Graduation year	Number of Data Point and Year(s)	Comparison Group	Sample	Weighted
White, Deshler, Schumaker, Warner, Alley, & Clark (1983)	Large suburban HS	LD: Cluster Non Ld: Random	1973 to 1979	(1) No date	Yes	47 youth with LD, 59 youth without LD	No
Cardoza & Rueda (1986)	HS&B	Cohort analyses- Sophomores and Seniors	1980 and 1982	(2) 1980 & 1982	Yes	Sub-sample: 534 youth with LD, 204 youth with disabilities	No

Miller, Snider & Rzonca (1990)	Iowa	Statewide Random Sample	1985	(1) 1985	No	539 youth with LD	No
Miller, Rzonca & Snider (1991)	Iowa	Statewide Random Sample	1985	(1) 1985	No	225 youth with LD	No
Wagner, Blackorby, Cameto, & Newman (1993)	NLTS	Stratified Random Sample of Youth with Disabilities who had graduated prior to 1990 data collection	1988 to 1990	(2) 1988 & 1990	No	1,208 youth with disabilities	Yes

Halpern, Yovanoff, Doren, & Benz (1995)	Oregon/ Nevada, Arizona	Stratified Random of Each State	Oregon/Nevada: 1990 Arizona: 1992	Oregon/ Nevada: (3) 1990, 1991, 1992 Arizona: (2) 1992, 1993	No	987 youth with disabilities	No
Rojewski (1996)	NELS:88	Cohort Analysis	1992	(2) 1998, 1992	Yes	404 youth with LD, 14,153, youth without LD	Yes
Rojewski (1999)	NELS:88	Cohort Analysis	1992	(3) 1988, 1992, 1994	Yes	441 youth with LD, 10,737 youth without LD	Yes
Hitchings, Retish, & Horvath (2005)	Two HS Western Illinois	Cluster Sampling	No date	(1): No date	No	110 youth with disabilities	No

Table 4

All Independent and Dependent Variables in the Special Education Studies

Citation	Family variable	Student variables	Student achievement	School variables	Other	Dependent Variable(s)
White, Deshler, Schumaker, Warner, Alley, & Clark (1983)	• Parents level of education • Parents income	•Happiness with past education* •Happiness with contacts with relatives* •Happiness with employment situation** •Educational plans* •Education aspirations**			•Employed •Job status* •Marriage status children •Social groups and activities/ clubs*	•None: Descriptive Study
Cardoza & Rueda (1986)	• Hispanic • Caucasian**	•Educational aspirations and expectation**	•Advanced math** •Foreign language**		•Influence of other persons •Future life	• Seniors: Postsecondary Enrollment

		• High school satisfaction	• Science** • Academic Track** • GPA**		satisfaction* • Educational and occupational outcome**	• Sophomores: High School Dropout Status
Miller, Snider & Rzonca (1990)	•Parental influences	•Gender •Intelligence** •Participation in extracurricular activities** •Dating behavior •Autonomy of individual •Peer influences • Use of community resources*	•Reading and math achievement	•Restrictiveness of high school special education program model •Inclusion or exclusion in vocational education design and implemented in special education programs during high school	•Inclusion or exclusion in vocational education while in high school •Size of community during high school •Competitive employment status • Community mobility	•Postsecondary Education Enrollment (i.e., Junior college, community college, four-year college/university, military, private training program, adult-based education)
Miller, Rzonca & Snider (1991)	• Parental Influences	• Gender** • Intelligence	• Reading achievement	• Restrictiveness of high school special	• Inclusion or exclusion in	• Postsecondary Education

		• Participation in extracurricular activities • Dating behavior • Autonomy of Individual** • Peer influences* • Use of community resources*	• Math achievement	education program model • Inclusion or exclusion in vocational education design and implemented in special education programs during high school	vocational education while in high school* • Size of community during high school • Competitive employment status • Community mobility**	Enrollment (i.e., Junior college, community college, four-year college/university, military, private training program)
Wagner, Blackorby, Cameto, & Newman (1993)	• Parenting status** • Ethnicity/Race • Annual household income** • One- or two-parent household*	• Gender • Primarily disability category • Self-care skills • Functional mental skills • took college preparatory classes*	• Taking advanced math or foreign language** • Taking vocational education	• Percent in student body in poverty	• Parental involvement in education • Parent expectations for their children's future**	• Postschool Outcomes (i.e., Postsecondary academic education, postsecondary vocational education, competitive

					employment, independent living)
Halpern, Yovanoff, Doren, & Benz (1995)	• Ethnicity/ race • Family income	• Gender • Disability • Student dropout status • Functional achievement** • Student satisfaction with instruction received** • Student needed and received transition planning* • Student still needed help*		• Instruction needed, received, completed • Prevalence of integrated instruction • Parent satisfaction with instruction received by student** • Congruence of student and parent expectations concerning student participation in continuing ed	• Postsecondary Education Enrollment (i.e., high school [complete GED or participated in postschool short course], community college, 4-year college, private vocational/technical school, job corps, sheltered workshop or rehabilitation facility, and military).

Rojewski (1996)	• Race/ Ethnicity	• Gender**	• Reading achievement		• 12th grade educational aspirations
	• SES	• Disability Status**	• Math achievement		
	• Locale	• Self-esteem	• Academic performance		• 12th grade Occupational aspirations
		• Locus of control			
Rojewski (1999)	• Race/ Ethnicity	• Gender	• Reading achievement**		• High school outcomes (primarily school, primarily work, neither)
	• SES	• Self-esteem**	• Math achievement		
		• Locus of control**	• Science achievement		
		• Educational aspirations**	• Academic performance**		
		• Occupational aspirations			
		• High school program			
Chen (2004)	• Race/Ethnicity**	• Gender**	• ACT composite score	• Anticipated college GPA**	• Counseling and educational guidance needs
	• SES**	• Disability type	• HS GPA		
		• Out-of-school			

	accomplishment* • HS extracurricular activities •Vocational choices*	• HS Curriculum Track**		• Gender • Ethnicity • Educational aspirations • Vocational choices
Hitchings, Retish, & Horvath (2005)	•Educational aspiration in 10th, 11th, and 12th grade •Occupational aspirations	•Coursework in 9th through 12th in college prep, general ed, and special ed	• Members of the IEP team	•None: Descriptive Study

* p< .05, ** p< .01

Table 5

Data Collection Timeline by Instrument

	Spring 10th Grade (2002)	Spring 12th Grade (2004)	Summer after 12th grade (2004)
English Direct Assessment	X		
Math Direct Assessment	X	X	
Student Survey	X	X	
Parent Survey	X		
English Teacher Survey	X		
Math Teacher Survey	X		
School Administer Survey	X	X	
Library/Media Survey	X		
School Facility Checklist	X		
High School Transcripts			X

Table 6

Comparison of the Percent of Youth by Disability Type between ELS:02 and NLTS2

	ELS:02 (10th Graders)	NLTS2 (15 - 17 year olds)
Specific learning disability	72	61
Speech/ language impairment	5	3
Mental retardation	8	13
Hearing impairment	-	2
Visual impairment	-	2
Orthopedic impairment	_	1
Other health impairment	5	5[a]
Multiple disabilities	2	2[b]

[a]includes autism and traumatic brain injury
[b]includes deaf-blindness
-    less the 10 cases for analysis

Table 7

Forty-seven Math Courses Classified under the Eight Math Pipelines

Math Pipeline	Math Course
No Math	No Math Courses
Non-Academic Math	Mathematics, Other General; Mathematics 7; Mathematics 7, Accelerate; Mathematics 8; Mathematics 8, Accelerated; Mathematics 1, General; Mathematics 2, General; Science Mathematics; Mathematics in the Arts; Mathematics, Vocational; Technical Mathematics; Mathematics Review; Mathematics Tutoring; Consumer Mathematics; Actuarial Sciences, Other; Applied Mathematics, Other; Basic Math 1; Basic Math 2; Basic Math 3; Basic Math 4
Low Academic Math	Pre-Algebra; Algebra 1, Part 1; Algebra 1, Part 2; Geometry, Informal
Middle Academic Math I	Pure Mathematics, Other; Algebra 1; Geometry, Plane; Geometry, Solid; Geometry; Mathematics 1, Unified; Mathematics 2, Unified; Geometry, Part 1; Geometry, Part 2; Unified Math 1, Part 1; Unified Math 1, Part 2; Pre-IB Geometry; IB Math Methods 1; IB Math Studies 1; Discrete Math; Finite Math; Algebra and Geometry; Mathematics, Other

Middle Academic Math II	Algebra 2; Mathematics 3, Unified; Pre-IB Algebra 2/Trigonomery
Advanced Math I	Algebra 3; Trigonometry; Analytic Geometry; Trigonometry and Solid Geometry; Algebra and Trigonometry; Algebra and Analytic Geometry; Linear Algebra; Mathematics, Independent Study; Statistics, Other; Statistics; Probability; Probability and Statistics; AP Statistics
Advanced Math II	Analysis, Introductory; IB Math Studies 2
Advanced Math III	Calculus and Analytic Geometry; Calculus; AP Calculus; IB Math Studies/Calculus; AP Calculus CD

Table 8

ELS:02 GPA Conversion Table[a]

F1CGRAGE	GPA
A+	5.00
A	5.00
A-	4.67
B+	4.33
B	4.00
B-	3.67
C+	3.33
C	3.00
C-	2.67
D+	2.33
D	2.00
D-	1.67
F	0.00

[a] From Educational Longitudinal study of 2002: First follow-up transcript component data file documentation

Table 9

Chi-square and T-tests Non-bias Reports

	Dropped Cases		Analytical Sample			
	N	%	N	%	Pearson X^2	*p*
Expected	9895	61.9%	4818	38.1		
Gender						
Male	4951	62.3	2377	37.7	1.08	0.30
Female	4944	61.4	2441	38.6		
Race/Ethnicity						
White	5441	57.5	2915	42.5	184.70	<0.01
Hispanic	1499	68.2	648	31.8		
African American	1434	70.1	517	29.9		
Other	1521	66.5	738	33.5		
Parental Education						
No College	2419	63.6	1328	36.4	7.15	0.01
Some College or More	7476	61.2	3490	38.8		
	N	M	N	M	t	*p*
SES	9895	-0.09	4818	-.05	-1.84[a]	0.07

[a] Equal Variances Not Assumed

Table 10

Frequency and Percents of the Student Level Baseline and Analytical Sample

	Baseline Sample		Analytical Sample	
	N	%	N	%
Gender				
Male	7413	50.3	2377	49.8
Female	7300	49.7	2441	50.2
Race/Ethnicity				
White	8883	62.2	2915	67.3
Hispanic	2365	15.1	648	13.4
African American	2110	13.7	517	11.2
Other	1355	9.0	738	8.1
Parental Education				
No College	4008	26.7	1328	26.0
Some College or More	10705	73.3	3490	74.0
	N	M	N	M
SES	14713	-0.07	4818	-0.05

Table 11

Chi-square Analysis Between Dropped Cases and Analytical Schools

	Dropped Cases		Analytical Sample			
	N	%	N	%	Pearson X^2	*P*
Expected	263	51.1	489	48.9		
Urbanicity						
Urban	120	61.5	130	38.5	79.85	<0.01
Suburban	110	39.8	251	60.2		
Rural	33	19.1	108	80.9		
	N	M	N	M	T	*P*
FARMS	263	2.26	489	3.97	-11.90[a]	<0.01

[a] Equal Variances Not Assumed

Table 12

Percent and Means Comparison Between the Baseline Schools and Analytical Schools

	Baseline Sample		Analytical Sample	
	N	%	N	%
Urbanicity				
Urban	250	21.4	130	13.0
Suburban	361	42.4	251	40.5
Rural	141	36.2	108	46.5
	N	M	N	M
FARMS	263	3.34	489	3.97

Table 13

Percent Comparison of Youth With and Without Disabilities on the Student and Family

Characteristics

	Youth without Disabilities		Youth with Disabilities	
	N	%	N	%
Expected	3889	80.7	929	19.3
Gender				
Male	1861	77.5	540	22.5
Female	2028	83.9	389	16.1
Race/Ethnicity				
White	2704	83.5	536	16.5
Hispanic	489	75.6	158	24.4
African American	400	73.8	142	26.2
Other	296	76.1	93	23.9
Parental Education				
No College	943	75.3	309	24.7
Some College or More	2946	82.6	620	17.4
Parental Expectation				
No College	113	62.1	69	37.9
College	3776	81.5	859	18.5

Table 14

Percent of Youth With and Without Disabilities by their Plans to Attend a 2- or 4-Year

College or University

	Youth without Disabilities		Youth with Disabilities	
	N	%	N	%
Attend 2- or 4-year college or university	3352	85.2	631	69.2
Other	554	14.8	281	30.8

Table 15

Chi-square Analysis of Youth With Disabilities Who Plan and Do Not Plan to Attend a 2- or 4- Year College or University

	Plan to Attend 2- or 4- College or University		Do Not Plan to Attend		
	N	%	N	%	Pearson X^2
Expected	631	69.2	281	30.8	
Gender					
Male	329	62.1	201	37.9	30.03*
Female	302	79.1	80	20.9	
Race/Ethnicity					
White	351	66.6	176	33.4	4.97
Hispanic	112	72.2	43	27.8	
African American	105	75.7	34	24.3	
Other	63	69.0	28	31.0	
Parental Education					
No College	191	63.0	112	37.0	8.06
Some College or More	440	72.2	169	27.8	

10th Graders Aspirations

Don't know	67	57.1	50	42.9	61.75*
Less than College	69	46.0	80	54.0	
2- or 4- College or University or More	495	76.7	150	23.3	

Parental Expectation

Less than College	31	45.3	37	54.7	19.20*
2- or 4- College or University or More	600	71.1	244	28.9	

Student Reported High School Track

General	277	66.6	139	33.4	28.42*
College Preparatory- academic	279	78.0	79	22.0	
Vocational- including technical/business	75	54.2	63	45.8	

*p< .05, with Bonferroni adjustment p < .008

Table 16

Pairwise Chi-Square Tests and Cramer's V Statistics

	Pearson Chi-Square	Cramer's V
10th Graders Aspirations		
Don't know vs. Less than College	3.15	0.11
Don't know vs. 2- or 4-year	19.41*	0.16
Less than College vs. 2- or 4-year	54.49*	0.26
High School Track		
General Education vs. College Prep	12.24*	0.13
General Education vs. Vocational	6.70*	0.11
College Prep. vs. Vocational	27.12*	0.23
Gender		
Male vs. Female	30.03*	0.18
Parental Expectation		
College vs. No College	19.20*	0.09
Parental Education		
College vs. No College	8.06*	0.15

*$p<.05$, with Bonferroni adjustment $p<.025$

Table 17

T-test Between Youth With Disabilities Who Planned and Do Not Planned to Attend a 2-

or 4- Year College or University on SES, GPA and Math Pipeline Variables

	2- or 4- College or University		Other			
	M	SD	M	SD	t	*p*
SES	0.14	1.05	-0.32	0.78	-7.31[a]	<0.01
Math Pipeline	4.67	1.69	3.42	1.38	-11.80 [a]	<0.01
GPA	2.47	0.77	2.18	0.66	-5.67 [a]	<0.01

[a] Equal Variances Not Assumed

Table 18

Chi-square Analysis of Youth With and Without Disabilities Who Plan Attend a 2- or 4-Year College or University

	No IEP N= 3,353		IEP/ Resource Room N= 631		
	N	%	N	%	Pearson X^2
Excepted	3,353	85.3	631	16.2	
Gender					
Male	1474	81.5	335	18.5	13.03*
Female	1837	85.7	307	14.2	
Race/Ethnicity					
White	2327	86.7	357	13.3	56.00*
Hispanic	393	77.5	114	22.5	
African American	336	75.8	107	24.4	
Other	255	79.8	64	16.3	
Parental Education					
No College	720	78.7	195	21.3	22.34*
Some College or More	2592	85.3	448	14.7	
10th Graders Aspirations					
Don't know	242	78.0	68	22.0	139.08*
Less than College	66	48.9	70	51.1	
2- or 4- College or University or More	3,003	85.6	504	14.4	

Parental Expectation

Less than College	61	65.6	31	34.4	23.08*
2- or 4- College or University or More	3,251	84.2	611	15.8	

Student Reported High School

Track

General	1,127	81.5	282	18.5	52.27*
College Preparatory- academic	1,953	87.3	284	12.7	
Vocational- including technical/business	232	75.2	76	24.5	

*p< .05, with Bonferroni adjustment p < .008

Table 19

Pairwise Chi-Square Tests with Cramer's V Statistic

	Pearson Chi-Square	Cramer's V
Race/Ethnicity		
White vs. Hispanic	28.84*	0.10
White vs. African American	35.70*	0.11
White vs. Other	11.26*	0.06
Hispanic vs. African American	0.37	0.02
Hispanic vs. Other	0.63	0.03
African American vs. Other	1.70	0.05
10th Graders Aspirations		
Don't know vs. Less than College	37.67*	0.29
Don't know vs. 2- or 4-year	13.25*	0.06
Less than College vs. 2- or 4-year	133.99*	0.19
High School Track		
General Education vs. College Prep	35.58*	0.10
General Education vs. Vocational	3.48	0.05
College Prep. vs. Vocational	32.73*	0.11
Gender		
Male vs. Female	13.03*	0.06
Parental Expectation		
College vs. No College	22.34*	0.08

Parental Education

College vs. No College	23.08*	0.08

*p<.05, with Bonferroni adjustment p<.017

Table 20

T-test Analysis for Youth Who Plan to Attend a 2- or 4- Year College or University With and Without Disabilities on SES, GPA and Math Pipeline Variable

| | No IEP | | IEP | | | |
	M	SD	M	SD	t	p
SES	0.09	0.98	-0.18	1.01	6.52	<.01
Math Pipeline	5.88	1.41	4.67	1.69	17.14 [a]	<.01
GPA	2.93	0.79	2.47	0.77	13.80	<.01

[a] Equal Variances Not Assumed

Table 21

Bivariate Correlation Matrix on the Student Level Variables

	Gender	High School Track	Math Pipeline	GPA	Parent's Education	Plans	Race/ Ethnicity	Parental Expectation for Student	IEP
High School Track	-0.02	_							
Math Pipeline	0.08	0.08	_						
GPA	0.23	0.07	0.63	_					
Parent's Education	-0.01	-0.01	0.19	0.17	_				
Plans	0.18	0.01	0.35	0.31	0.14	_			
Race/ Ethnicity	-0.02	0.03	-0.10	-0.19	-0.06	-0.01	_		
Parental Expectation for Student	0.03	0.00	0.18	0.13	0.17	0.16	-0.05	_	
Disability	-0.08	-0.02	-0.35	-0.21	-0.08	-0.16	0.09	-0.09	_
SES	0.00	0.00	0.35	0.34	0.59	0.22	-0.18	0.18	-0.13

Table 22

The Log-Odds Related to a Youth's Plans to Attend a 2- or 4-Year College or University on the Academic Experiences, Student and Family Characteristics, and School Context

Independent Variables	Model 1	Model 2	Model 3	Model 4
Intercept	1.39*	1.78*	2.02*	2.09*
Urbanicity				
Urban				0.34*
Rural				-0.12
FARMS				-0.06
IEP	-1.08*	-0.51*	-0.40*	-0.42*
College Prep		0.47*	0.39*	0.40*
GPA		0.65*	0.51*	0.53*
Math pipeline		0.41*	0.39*	0.39*
GPA*IEP		-0.46*	-0.41*	-0.40*
Parental Education			-.0.12	-0.11
Parental Expectations			0.34	0.35
Student's Race				
Black			0.75*	0.72*
Hispanic			0.47*	0.39*
Other			0.38	0.37
SES			0.56*	0.53*
Males			-0.82*	-0.81*

Note: Unweighted n= 4,818 students, unweighted n=489 schools., *p<.05

Table 23

Variance Component at the Intercept in Each Model

	Variance Component	p
Unconditional Model	0.26	<0.01
Model 1	0.19	<0.01
Model 2	0.16	0.01
Model 3	0.11	0.07

*p<.01

FIGURES

Figure 1

Selection Process of the Student-level Analytical Sample from the Panel Sample
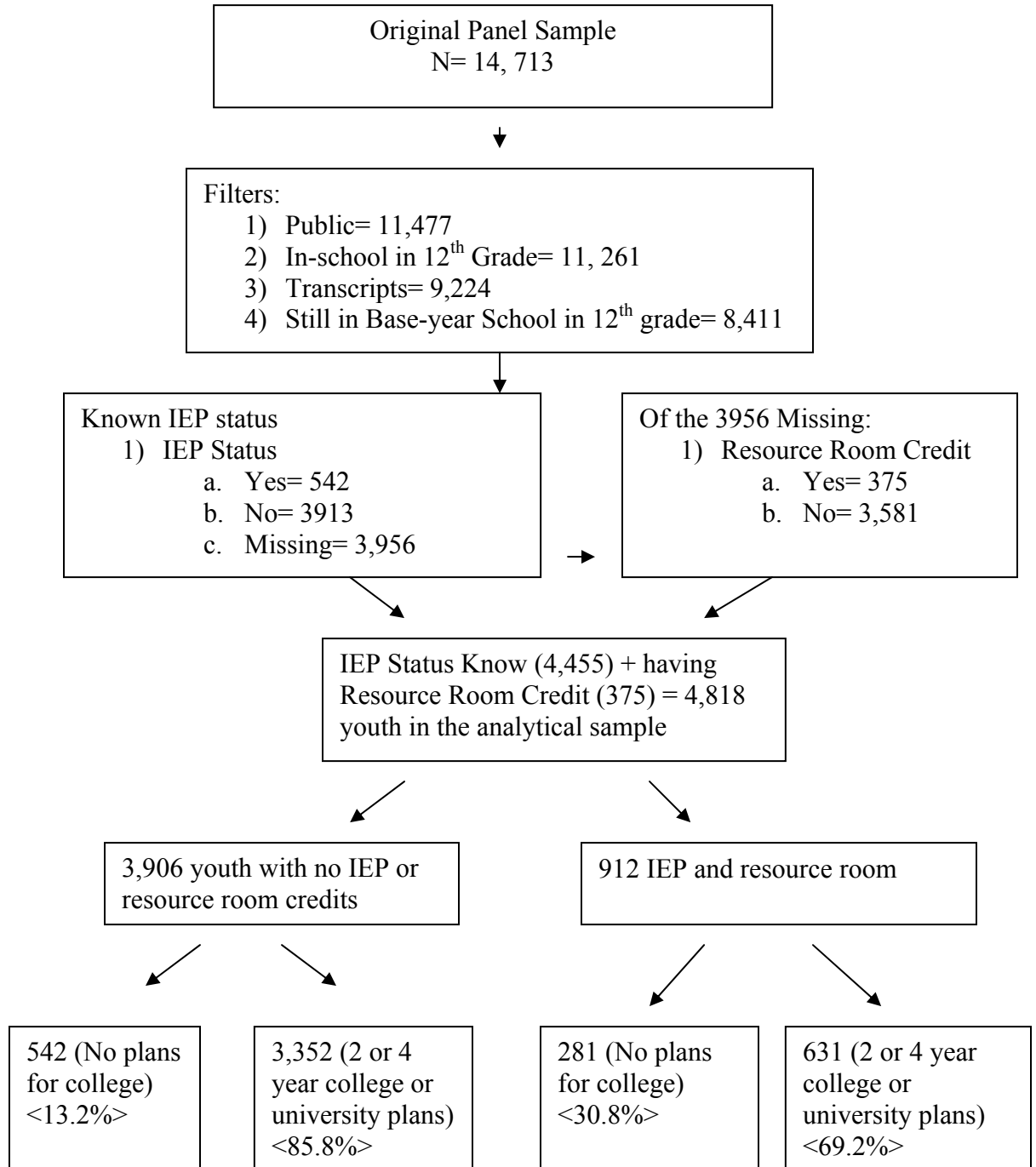
```
                    ┌─────────────────────────────┐
                    │    Original Panel Sample     │
                    │       N= 14, 713             │
                    └─────────────────────────────┘
                                  │
                                  ▼
        ┌──────────────────────────────────────────────────────┐
        │  Filters:                                             │
        │     1)  Public= 11,477                                │
        │     2)  In-school in 12ᵗʰ Grade= 11, 261              │
        │     3)  Transcripts= 9,224                            │
        │     4)  Still in Base-year School in 12ᵗʰ grade= 8,411│
        └──────────────────────────────────────────────────────┘
                                  │
                                  ▼
```

Known IEP status
  1) IEP Status
     a. Yes= 542
     b. No= 3913
     c. Missing= 3,956
	Of the 3956 Missing:
	  1) Resource Room Credit
	     a. Yes= 375
	     b. No= 3,581

IEP Status Know (4,455) + having
Resource Room Credit (375) = 4,818
youth in the analytical sample

3,906 youth with no IEP or resource room credits	912 IEP and resource room

| 542 (No plans for college) <13.2%> | 3,352 (2 or 4 year college or university plans) <85.8%> | 281 (No plans for college) <30.8%> | 631 (2 or 4 year college or university plans) <69.2%> |

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Figure 2

Selection Process of the School -level Analytical Sample from the Base-Year Sample

Base-Year High Schools

CCD (Public HS)   PSS (Catholic/Other Private High School)
Selected 8 Regions & 3 Metro Status   Selected 4 Regions & 3 Metro Status
N= 580   N= 172

Total Number Invited Schools: N= 1221
Total Number of Participating Schools: N= 752

Reduction of Schools: at least one student in the analytical sample must be in the school

Analytical Sample of Schools
N= 489
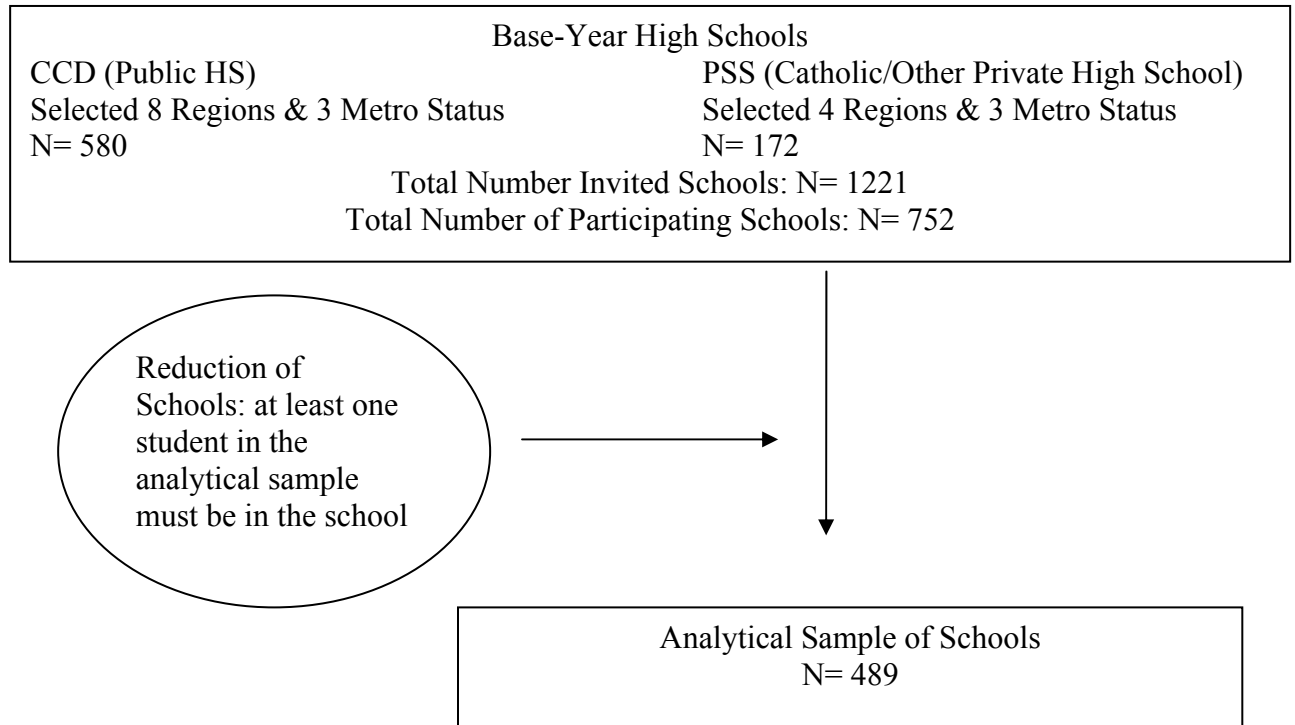
Figure 3.

Comparison of Youth With IEP Who Plan and Do Not Plan to Attend a 2- or 4-Year

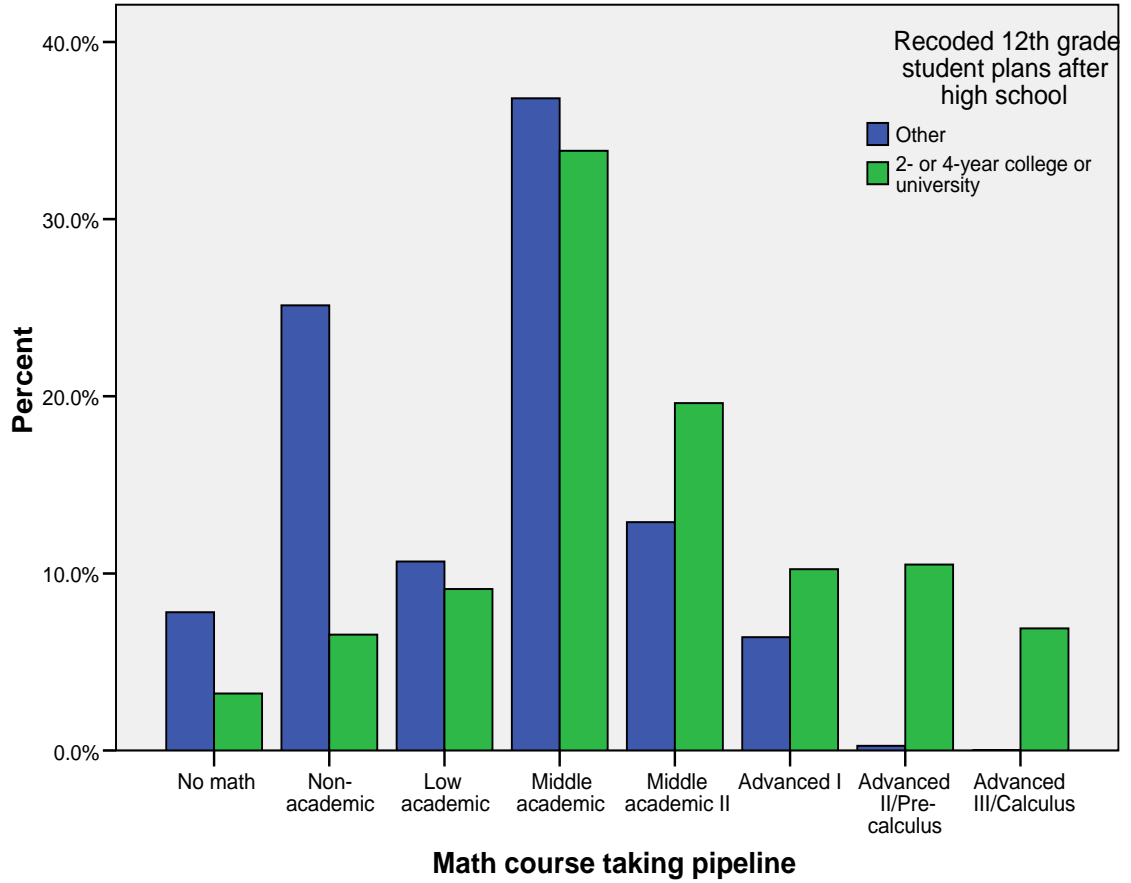*College or University in 12th Grade on the Math Pipeline*

Figure 4.

Comparison of Youth With IEP to Their Peers Without Disabilities Who Plan to Attend a
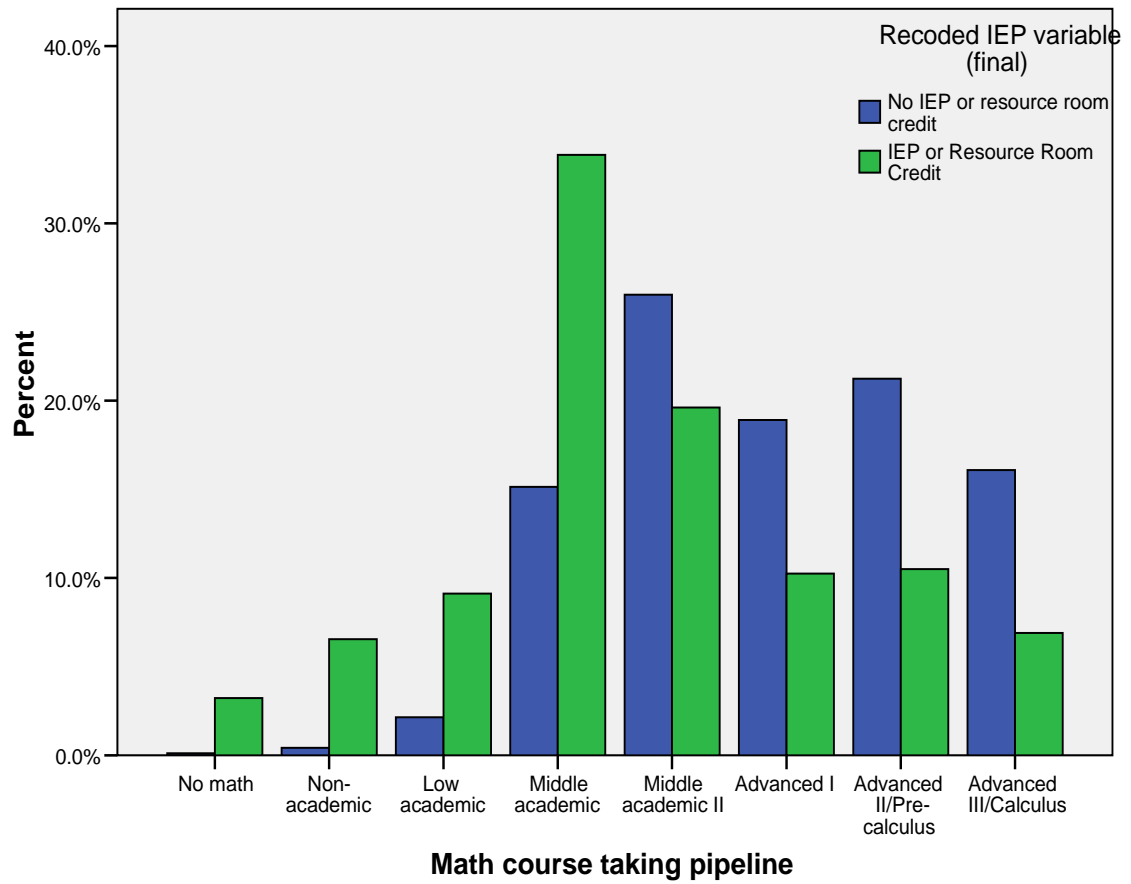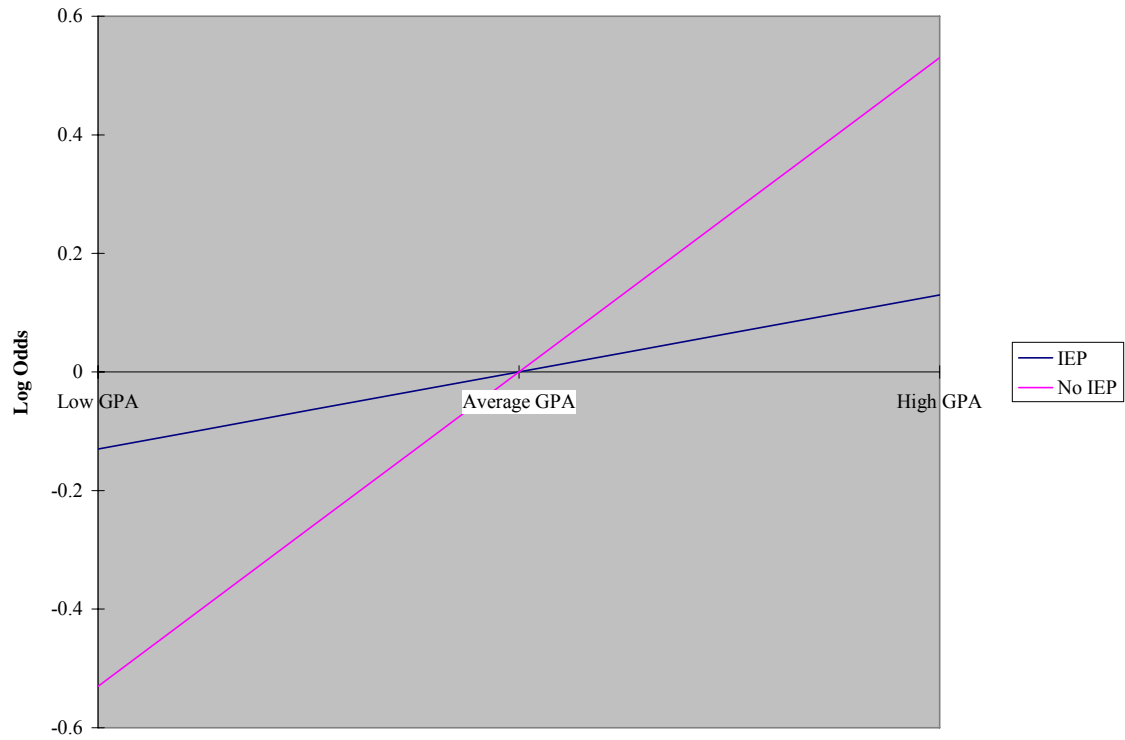
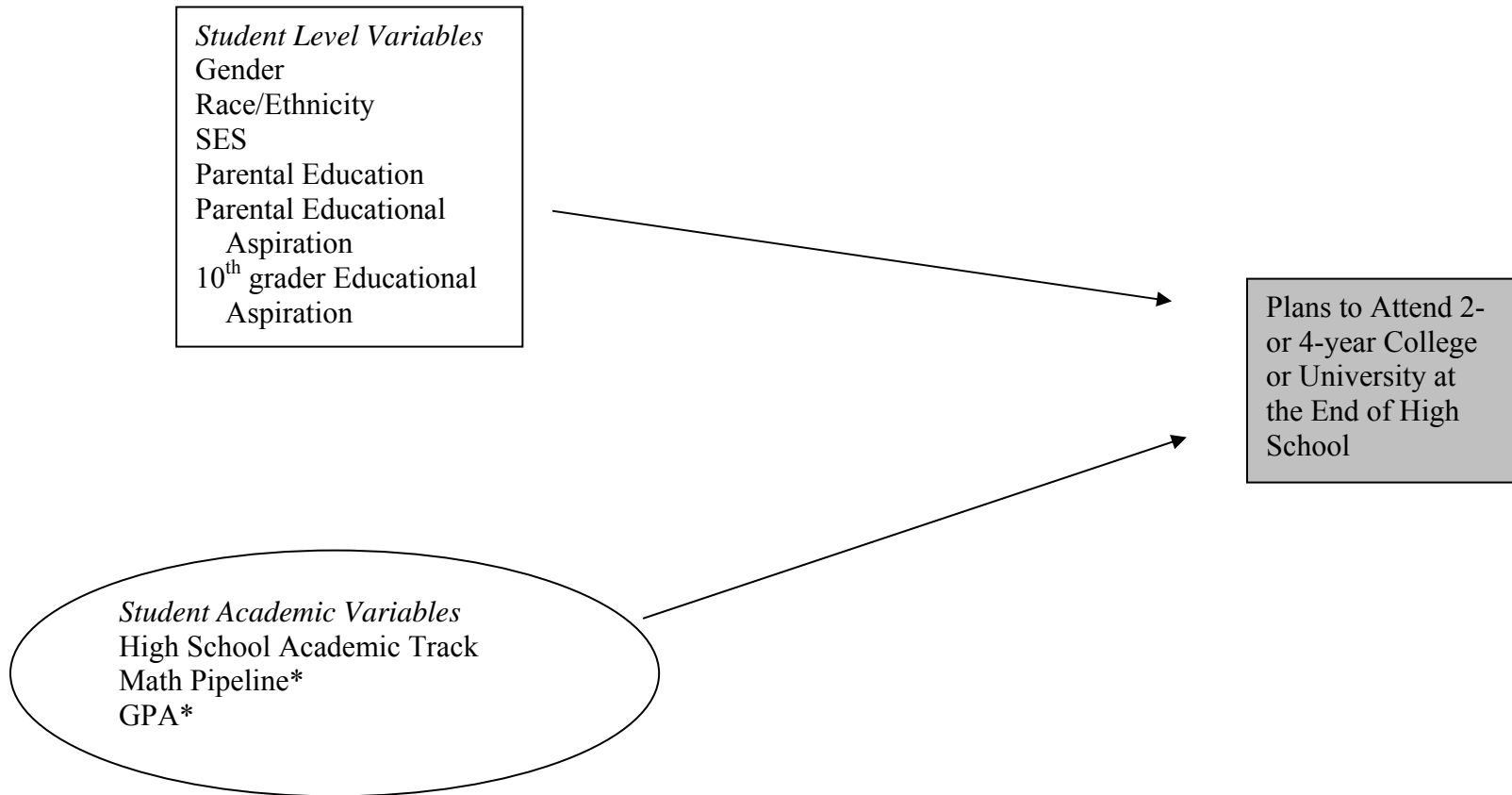*2- or 4-Year College or University on the Math Pipeline*

Figure 5

Interaction Between GPA and IEP on Plans to Attend 2- or 4-Year College or University
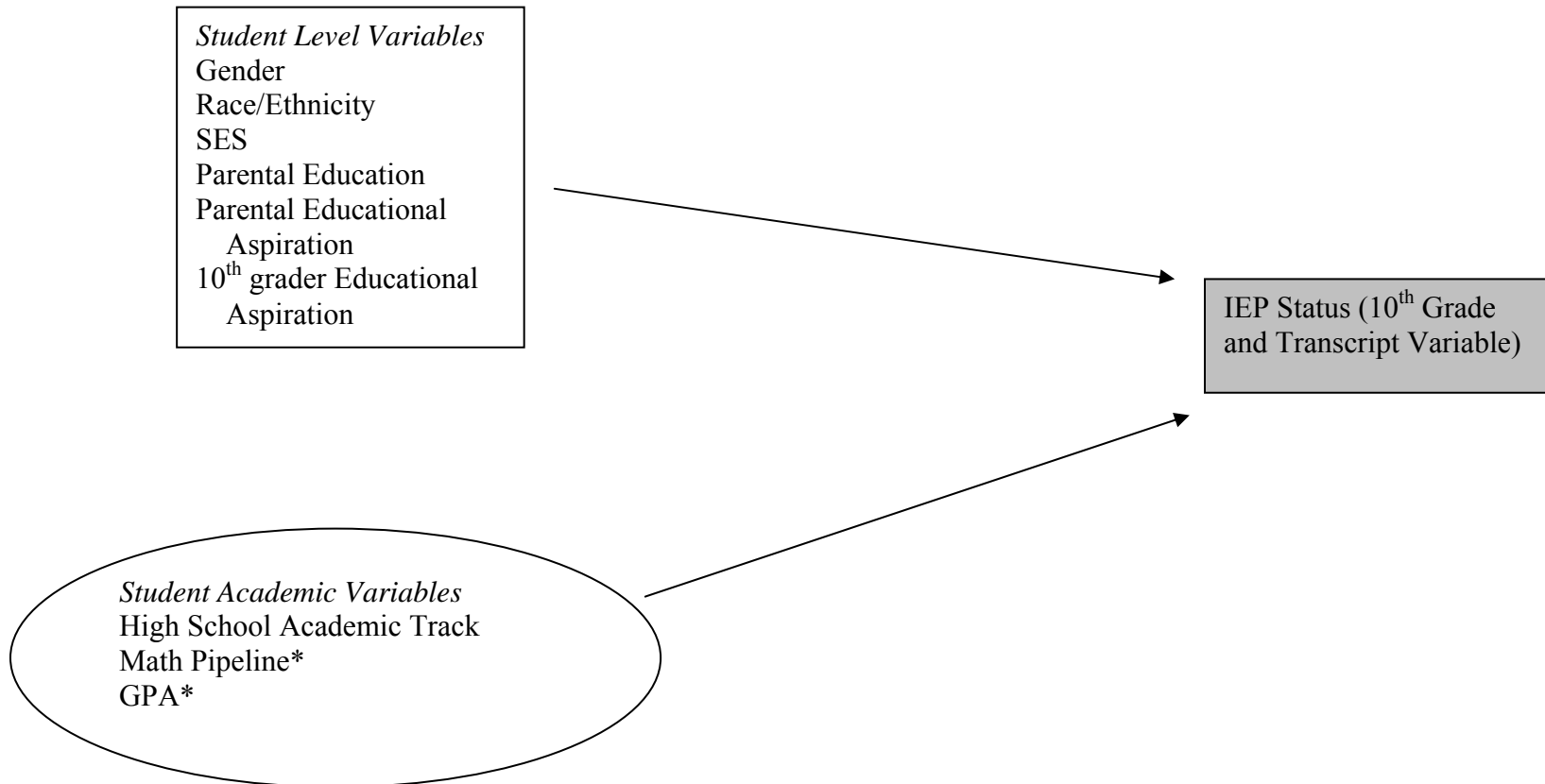
for Youth With and Without Disabilities

Appendix A
Conceptual Models

Conceptual Model of Question 1

Student Level Variables
Gender
Race/Ethnicity
SES
Parental Education
Parental Educational
    Aspiration
10th grader Educational
    Aspiration

Plans to Attend 2-
or 4-year College
or University at
the End of High
School

Student Academic Variables
High School Academic Track
Math Pipeline*
GPA*

*Variables taken from the transcript data

Conceptual Model of Question 2

Student Level Variables
Gender
Race/Ethnicity
SES
Parental Education
Parental Educational
   Aspiration
10th grader Educational
   Aspiration

IEP Status (10th Grade
and Transcript Variable)

Student Academic Variables
High School Academic Track
Math Pipeline*
GPA*

HGLM Conceptual Model

Student Level Variables
IEP
Gender
Race/Ethnicity
SES
Parental Education
Parental Educational
   Aspiration

Plans to Attend 2- or 4-
year College or
University at the End of
High School

Student Academic Variables
High School Academic Track
Math Pipeline*
GPA*

School Level Variables
Locale
FARMS

*Variables taken from the transcript data

Appendix B

Courses Listed Under Special Education/ Resource Curriculum Credit

562300 Special Education Language Arts
562301 Resource Language Arts/English
562302 Developmental English 2/Resource ESE AAP English 2
562303 Developmental English 3/Resource ESE AAP English 3
562304 Developmental English 4/Resource ESE AAP English 4
562309 Developmental English 4/Resource ESE AAP English 4
562310 Special Education Reading
562311 Resource Writing
562319 Resource Reading, not taken for credit
562320 Special Education Writing
562321 Resource Writing
562322 Resource Room English 2 (Special Education)
562329 Resource Writing, not for credit
562700 Special Education Math
562701 Resource General Math
562709 Resource General Math, not for credit
562711 Resource Vocational Math
562719 Resource Vocational Math, not for credit
562721 Resource Consumer Math
562729 Resource Consumer Math, not for credit
563201 Resource Career Exploration/Pre-Vocational Skills
563209 Resource Career Exploration/Prevocational Skill, not for credit
563211 Resource Transition Skills
563219 Resource Transition Skills, not for credit
564000 Special Education General Science
564001 Resource General Science
564009 Resource General Science, not for credit
564500 Special Education Social Studies
564501 Resource Social Studies
564509 Resource Social Studies, not for credit
569001 General Tutorial Services
569009 General Tutorial Services, not for credit
569101 Resource Study Skills
569109 Resource Study Skills, not for credit
569201 School and Social Survival Skills
569209 School and Social Survival Skills, not for credit
569301 Resource Survival Skills
569309 Resource Survival Skills, not for credit
569401 Handicap Specific Support Services
569409 Handicap Specific Support Services, not for credit

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Endnotes

[i] Berktold et al. (1997) developed a college qualification index in order to assess the qualifications of youth to enter a 4-year college or university upon leaving high school. The composite index included five variables: (a) overall grade point average (GPA), (b) senior class rank, (c) NELS:88 composite test score from 1992 data collection (composite variable derived from the math and reading NELS 2nd follow-up test scores), (d) total SAT test score, and (e) American College Testing (ACT) test score. In order to be considered *minimally* qualified for admissions at a 4-year college, youth had to meet or exceed one of the following thresholds: (a) overall GPA = 2.7, (b) senior class rank percentile = 54, (c) NELS:88 1992 composite test in the 56 percentile, (d) total SAT test score = 820 and (e) ACT = 19.