

BEST PRACTICES IN POSTSECONDARY TRANSITION PLANNING FOR
STUDENTS WITH AUTISM SPECTRUM DISORDER (ASD)

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ABSTRACT

Students with an educational classification of Autism Spectrum Disorder (ASD) make up 1.1% of the total enrollment in public schools and 8.3% of the total number of students receiving special education services and is the fastest growing disability classification (U.S. Department of Education, 2016). As more students with these unique needs begin to age out of the educational system, the demand for quality transition planning services that address the spectrum of ability in this population increases. While IDEA (2018) provides some basic guidelines, there is significant room for interpretation and individualization within these mandates. As such, practitioners are often left searching the available literature to determine the best way to provide students, families, and school personnel with some guidance in interpreting and implementing federal law. Furthermore, the best practices literature is limited and often does not address some of the unique needs of students with ASD, given the core features of the classification (Wehman, 2013). The current study evaluates school program variables that predict postsecondary outcomes in education/training and employment for students with ASD and considers the individual student and family variables that vary with this relationship. Consistent with the literature (Kohler & Fields, 2003), results suggest that student focused-planning, student development, and interagency collaboration correlate with postsecondary education/training and employment outcomes. In addition, consistent with what we know about the broader population of students receiving special education services (Landmark, et al., 2010) and the theoretical work (Wehman, et al., 2014), the current study demonstrates that inclusion in the general education setting in an academically rigorous content area is also related to postsecondary success in

education/training and employment. These findings not only highlight the importance of including students with ASD in the general education classroom as part of their transition programming, but it also speaks to the need for additional research about inclusion practices as part of the child's transition plan for students with ASD.

DEDICATION

I dedicate this work to my amazing husband, Scott, and our beautiful son, Scott Michael. Scott, you provided our family with stability that afforded me the opportunity to complete my degree. Thank you for the countless times you placed my needs above yours. There is absolutely no way I could have done this without you. Scott Michael, experiencing the world through your eyes is my greatest pleasure. Thank you both for taking this journey with me and for supporting me along the way. I love you more than you will ever know, and I share this doctorate, and all it stands for, with you.

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CHAPTER 1

STATEMENT OF THE PROBLEM AND RESEARCH QUESTIONS

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder defined by two core features, difficulties with social communication and restrictive and repetitive behavior patterns (American Psychiatric Association, 2013). It is estimated that one in 54 children are identified with ASD (Baio, et al., 2018). This number has steadily increased within the past decade. Additionally, when considering all students receiving special education services, ASD is the fastest growing disability category. The National Center for Education Statistics estimates that during the 2013-2014 academic year, approximately 538,000 students with ASD were served under IDEA Part B. This constitutes 1.1% of the total enrollment in public schools and 8.3% of the total number of students receiving special education services. Furthermore, this is the fourth largest population receiving special education and related services, behind Specific Learning Disability (SLD), Speech or Language Impairment (SLI), and Other Health Impairment (OHI; U.S. Department of Education, 2016). As more and more of these students begin to graduate from high school, a greater emphasis on ensuring that all students are prepared for postsecondary success is needed.

For all students, adolescence is a time of significant change. The transition from secondary school to adulthood can be a particularly challenging time for any adolescent with a substantial disability (Wehman, 2013). Individuals with ASD may be overly dependent on routines and highly sensitive to changes in their environment. While students with ASD face challenges similar to those faced by their typically developing peers and their peers receiving special education services, deficits in socialization and

communication can make this a particularly demanding time for these students as they must prepare for life without the daily structure of school (Hendricks & Wehman, 2009). Diagnostic characteristics including difficulties with social interaction, relationship development and maintaining conversations, pervasive or obsessive thought patterns, emotion dysregulation, and difficulty interpreting social cues may impede these students from achieving societal expectations of adulthood. This is complicated by the lack of services available that address these specific needs (Anderson, Lupfer, & Shattuck, 2018). Given the growing interest in academic performance and educational outcomes for all students, including students with disabilities, there has been increased emphasis measuring of post-school outcomes for young adults with disabilities. When considered collectively, the literature demonstrates that, as a group, students with disabilities continue to lag behind their typically developing peers in obtaining jobs and accessing postsecondary education. For those who do obtain employment, most earn less than their typically developing counterparts do (Carter, Austin, & Trainor, 2011; Newman, Wagner, Cameto, & Knokey, 2009, Newman, et al., 2011). Additionally, these individuals are less likely to live independently, have obtained financial independence, or have been married (Newman, et al., 2011).

Similarly, research indicates that the post-school outcomes for students with ASD are generally poor. Most adults with ASD do not have a bachelor's degree or a paid job (Hurlbutt & Chalmers, 2004). Additionally, when employed, the majority of adults with ASD are paid less than their non-disabled counterparts (Howlin, Goode, Hutton, & Rutter, 2004). As a group, young adults with ASD are far less likely than most of their peers receiving special education services to access meaningful opportunities for

postsecondary education, civic engagement, employment, and peer relationships in the early years after high school (Newman, et al., 2009). Many authors suggest that these findings result from gaps in the transition-planning process and a lack of autism-specific transition-planning services, as well as a lack of available services for adults with ASD (Shattuck, et al., 2012; Taylor & Seltzer, 2010). For these reasons, while adequate, evidence-based transition-planning services are essential for all students who receive special education, the unique needs of students with ASD as a group must be considered separately.

Since the introduction of transition planning into federal law, successful implementation has required balancing federal legislation and best practices research. IDEA (2018) mandates that the Individualized Education Program (IEP) team provide transition-planning services for students who receive special education no later than age 16. This comprehensive transition plan should include appropriate, measurable postsecondary goals based on the students' interests and strengths (Public Law § 1401[34], 2018). However, research demonstrates that many students with ASD do not receive appropriate transition services (Hetherington, et al., 2010; Hendricks & Wehman, 2009). Consequently, there is a renewed emphasis on evidence-based transition services in the literature, particularly as more students with ASD begin to reach adulthood. The current literature on best practices in transition planning identifies several key components necessary to facilitate a successful post-school transition. Kohler and Field (2003) review the contemporary secondary transition literature and identify five key areas of focus: student-focused planning, student development, interagency collaboration, family involvement, and program structures. Test, Fowler, Richter, and colleagues

(2009) and Landmark, Ju, and Zhang (2010) provide comprehensive reviews of the existing transition research, including studies that fit the criteria outlined by Kohler and Field (2003). This research indicates that majority of evidence-based transition-planning strategies focus on the area of student development (Test, et al., 2009; Landmark, et al., 2010). Most include paid or unpaid work experience, employment preparation, general education inclusion, social skills training, daily living skills training, and self-determination skills training. Additionally, family involvement is a significant contributor to successful transition planning (Test, et al., 2009; Landmark, et al., 2010). However, it is noted that there is a significant amount of variability in the nature of the research examining evidence-based transition-planning practices. While there are benefits of such varied research findings, variability can also make it difficult to draw meaningful and consistent conclusions that generalize to other populations.

When considering the transition experiences of all students with disabilities, there are areas where educational practices clearly fall short of federal mandates and best practices. In addition, recent research demonstrates that postsecondary transitions for students with ASD are particularly inadequate (Shattuck, et al., 2012). Therefore, it is crucial to identify key elements of the transition-plan that meet the unique needs of students with ASD. However, this is challenging given that the available literature on evidence-based practices is limited for all students with disabilities, and an even smaller subset of this literature examines students with ASD as a unique group (Wehman, 2013; Wehman, et al., 2014).

Hendricks and Wehman (2009) and Schall (2009) provide recommendations for effective service delivery practices specifically for students with ASD. Of note, the

authors emphasize the need for student-centered transition planning and the inclusion of goals that address the full range of post-school options to ensure that students with ASD reach their full potential (Hendricks & Wehman, 2009). In addition to those strategies which have a significant evidence base for all students with disabilities (Landmark, et al., 2010; Test, et al., 2009), Schall and Wehman (2009) emphasize the importance of using strategies that align closely with the specific deficits exhibited by students with ASD. Additionally, Schall, Target, and Wehman (2013) emphasize the need for a team-based approach to support students with ASD in acquiring skills and learning behaviors that will increase their success in adulthood.

In summary, it becomes clear that several significant factors associated with transition planning are evidence-based but not addressed in the federal law, which provides a guideline for only the minimum amount of services required to help students with disabilities transition successfully. Additionally, it is challenging to implement many of the evidence-based approaches in the school setting with fidelity. This is true for all students with disabilities (Cameto, et al., 2004). However, many of the strategies most challenging to implement are also the ones that address the core deficits associated with ASD and are therefore integral in promoting a successful postsecondary transition for these students (Schall, et al., 2013; 2013; Schall & Wehman, 2009; Wehman, 2013; Wehman, et al., 2014). Of particular note is the focus on interpersonal skills (Carter & Hughes, 2013), through both direct instruction and exposure to inclusive settings (Wehman, et al., 2014), and positive behavioral support interventions (Schall & Wehman, 2009). These intervention strategies are vital, given that they not only support successful postsecondary transitions for all students, but also address the core deficits

associated with ASD. Overall, the available literature on evidence-based transition-planning practices is limited (Wehman, 2013). An even smaller percentage of these studies examine the factors that predict postsecondary success for students with ASD separate from other disability categories. Furthermore, these studies are often descriptive and make few recommendations for practice (Wehman, et al., 2014). This further limits the implementation of the evidence base for this unique population. In addition, research demonstrates that postsecondary transitions for students with ASD are particularly inadequate (Shattuck, et al., 2012). Therefore, identifying crucial elements of the transition planning process that meet the unique needs of the population of students with ASD is an area in need of more research.

Statement of the Problem

Adolescence is a time of major change for all students. The transition from receiving school-based services to the independence that comes with adulthood can be a particularly difficult time for adolescents with significant disabilities (Schall & Wehman, 2009) including students with ASD (Hendricks & Wehman, 2009). In some ways, students with ASD are no different from their neurotypical peers, as all students face challenges as they prepare to pursue their individual postsecondary goals. However, difficulties in socialization and communication can make this a particularly challenging time for students with ASD, as these skills are essential for success in all aspects of postsecondary life. Furthermore, research suggests when compared to their typically developing peers, students with disabilities struggle to obtain employment and access postsecondary education (Newman, et al., 2009; Newman et al., 2011). Comparatively, students with ASD have even more difficulty than students with other disabilities in

accessing meaningful opportunities for postsecondary education, civic engagement, employment, and peer relationships (Newman, et al., 2009, Newman, et al. 2011). Taken collectively, this speaks to a need for quality transition planning for all students who receive special education services. When examining the current implementation of transition plans, it appears that school personnel struggle to translate the literature into practice (Shattuck, et al., 2012). The significant amount of variability in the nature of the research examining evidence-based transition-planning practices makes it difficult to draw meaningful and consistent conclusions that generalize to other populations. Furthermore, the best practices literature is limited (Wehman, 2013) and often does not address some of the unique needs of students with ASD given the core features of their disability.

Research Question and Hypotheses

1. What school program variables predict postsecondary outcomes in education/training and employment for students with ASD?
2. What individual student and family variables moderate this relationship?

CHAPTER 2

LITERATURE REVIEW

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder defined by two core features, difficulties with social communication and restrictive and repetitive patterns of behavior (American Psychiatric Association, 2015). Social communication and interaction difficulties include deficits in social-emotional reciprocity, deficits in nonverbal communicative behaviors used for social interaction, and deficits in developing and maintaining developmentally appropriate relationships. Restrictive and repetitive patterns of behavior can include stereotyped or repetitive speech, motor movements, or use of objects, excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change, highly restricted, fixated interests that are abnormal in intensity or focus, and hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment. Individuals with ASD may be overly dependent on routines and highly sensitive to changes in their environment. The symptoms of ASD are commonly defined as one point on a spectrum where the level of impairment can range from almost total impairment to some, but not optimal, functioning. Typically, these symptoms manifest prior to age three, however, for some children symptoms do not appear until later, when social demands increase. These primary characteristics of ASD are most evident in early childhood. By adolescence and early adulthood, students with ASD often make significant gains in language acquisition, stereotypic behaviors subside, and social skills improve. However, when compared to their neurotypical peers, significant differences in postsecondary

outcomes exist, which suggests that diagnostic features associated with ASD continue to affect these adolescents as they transition to adulthood (Schall & McDonough, 2010).

It is estimated that one in 54 children are identified with ASD (Baio, et al., 2018). This number has steadily increased within the past decade and varies widely by community, ranging from one in 175 children in the state of Alabama to one in 45 children in areas of New Jersey. Additionally, ASD is five times more likely in boys than in girls (one in 34 boys vs. one in 145 girls). Research suggests that girls who receive a diagnosis of ASD demonstrate greater symptom thresholds and additional behavioral problems or a comorbid diagnosis of intellectual disability (Banach, et al., 2009; Dworzynski, Ronald, Bolton, & Happé, 2012). Therefore, this male to female ratio is lower in individuals with intellectual disability and higher at the high-functioning end of the autism spectrum. ASD is the fastest growing developmental disability category. The National Center for Education Statistics estimates that during the 2013-2014 school year, approximately 538,000 students with ASD were served under IDEA Part B. This constitutes 1.1% of the total enrollment in public schools and 8.3% of the total number of students receiving special education services. Furthermore, this is the fourth largest population receiving special education and related services, behind specific learning disability, Speech or Language Impairment, and Other Health Impairment (U.S. Department of Education, 2016). For all students, adolescence is a time of major change. Students with ASD face challenges similar to those encountered by their neurotypical peers. However, deficits in socialization and communication that are unique to ASD, and core to the diagnosis, can make this a particularly challenging time for these students.

Transition planning is a process designed to help students with an IEP decide what they want to do after high school and how to achieve their postsecondary goals. Historically, the Bridges Model of Transition (Will, 1984) and federal initiatives that culminated in the position paper on transition from the United States Office of Special Education and Rehabilitation Services (OSERS; 1984) are recognized as bringing national attention to postsecondary transitions (Halpern, 1994; Kohler, 1996). IDEA (2018) defines the transition plan as a coordinated set of activities that are designed to be within a results-oriented approach and that focuses on improving the academic and functional achievement of the student in order to facilitate movement from school to postsecondary activities. Currently, IDEA (2018) mandates that the multidisciplinary team begins the transition-planning process for students receiving special education services no later than age 16. Some state statutes add to the IDEA provision by retaining the age of 14 (e.g., DE, DC, FL, KS, MD, MA, MS, NE, NM, OH, RI, VA and WI) or selecting another triggering point younger than age 16 (e.g., IL—age 14 and a half, MN—grade 9, etc.). This comprehensive transition plan should include appropriate, measureable postsecondary goals that are based on students' interests and strengths (Public Law § 1401[34], 2018). However, there is a significant amount of room for interpretation and individualization within these mandates. As such, practitioners are often left searching the available research base in order to determine the best way to provide students, families, and school-personnel with some guidance in interpreting and implementing federal law, in ways that will promote post high school success. Additionally, as more students with ASD begin to reach transition age, evidence-based

transition services for this population specifically is receiving some attention in the literature.

Ideally, the transition process is designed to maximize the potential for postsecondary opportunities including vocational training, independent living, and college when possible (Rowe, et al., 2015). However, research demonstrates that many students with ASD do not receive appropriate transition services (Hetherington, et al., 2010). Additionally, when compared to their peers who receive special education services, in the early years after high school completion young adults with ASD are less likely to access meaningful opportunities for postsecondary education, civic engagement, and peer relationships (Shattuck, et al., 2012). The current chapter will discuss the transition process broadly and considers difficulties faced by all students receiving special education services, highlighting the unique challenges and needs of students with ASD. Evidence-based transition-planning practices and variables that predict postsecondary success are discussed.

Post-School Outcomes for Students with Disabilities

Given the growing interest in academic performance and educational outcomes for all students, there has been increased measurement of post-school outcomes for young adults with disabilities. In 2001, the U.S. Department of Education, OSEP (2001-2011), and the Institute of Education Services (U.S. Department of Labor, 1997), commissioned the National Longitudinal Transition Study-2 (NLTS-2) as part of the national assessment of the 1997 IDEA. The NLTS-2 was intended to provide a national description of the experience and achievement of young people as they transition to adulthood. The study included 11,270 youth age 13-16 nationwide. Information was collected over 10 years

from parents, youth, and schools. Currently, data from the NLTS-2 provides the most comprehensive, national picture of postsecondary outcomes for students receiving special education services.

National Longitudinal Transition Study-2

NLTS-2 data provide postsecondary education, employment, independence, and social information for secondary school students who received special education services up to eight years after high school completion. At this time respondents range in age from 21-25 years old. Four years after high school completion, only 43% of youth with disabilities had enrolled in two year or community college (Newman, et al., 2009), compared to 67% of the general population who report attending either two year or four year institutions during this timeframe (Flannery, Yovanoff, Benz, & Kato, 2011). This number increases at eight-years post graduation, where 60% of young adults with disabilities were reported to have attended a two year or community college, four year college, vocational school, business school, or technical school (Newman et al., 2011). The majority of these students were enrolled in a two year or community college and most did not disclose information about their disability to the institution in order to receive accommodations from the postsecondary school (Newman, et al., 2009; Newman et al., 2011). Regarding employment, data from the NTLTS-2 suggests that 59% young adults with disabilities obtained a paying job outside of the home at some point in the first four years after high school graduation. This number reaches 91% when we look at rates eight years out of secondary school. At that point in time, 67% of young adults with disabilities are working full-time. The mean hourly wage reported was \$10.40, with individuals working full time earning more on average than those working part time.

This is less than adults in the general population, who on average earned \$11.40 per hour at this same age (Newman, et al., 2009). Taken collectively, these data indicate that there are a large number of young adults with disabilities who remain unemployed or underemployed 1-4 years after high school (41%). Of those who do obtain employment, most do not earn the same as their typically developing counterparts.

NLTS-2 data also include information on engagement in the community more broadly. Specifically, data regarding financial and residential independence, self-sufficiency, marriage, parenting, and social inclusion were also collected. Eight years after graduating high school, 59% of young adults with disabilities report that they had lived independently at some point. Another 4% report living semi-independently (e.g., college dormitory or military housing). A total of 29% of young adults with disabilities reported having had or fathered a child, and 13% were married. Regarding social inclusion, NLTS-2 data indicate that most young adults with disabilities have active friendships. They interact with friends both in person outside of organized activities, as part of organized activities, and on the computer.

In categories where similar data are available, Newman and colleagues (2011) provide comparison between young adults with disabilities and the general population. The comparison data come from the National Longitudinal Survey of Youth, 1997 (NLSY97), The National Longitudinal Study of Adolescent Health (ADD Health), and the Current Population Survey (CPS) 2009. When considered collectively, the data demonstrate that, as a group, individuals with disabilities continue to lag behind their typically developing peers in obtaining jobs and accessing postsecondary education. For those who do obtain employment, most do not earn the same as their typically developing

counterparts. Similarly, postsecondary completion rates of students with disabilities are lower than their peers in the general population. These discrepancies are most apparent four years after high school graduation. The gap between students with disabilities and their typically developing peers still exists, but begins to narrow eight years after high school graduation. Additionally, eight years after exiting secondary school young adults with disabilities are less likely to live independently, have obtained financial independence, or have been married. This points to a need for greater participation in the planning of their future, increased opportunities to access employment prior to exiting school, and access to a range of services to provide ongoing and long-term support in the community (Getzel & DeFur, 1997).

Post-School Outcomes for Students with ASD

The NLTS-2 data discussed above provide a broad picture of what life is like for all youth with disabilities after they graduate from high school (Newman et al., 2009; Newman, et al., 2011). However, disability category differences in most of these postsecondary outcome categories exist. NLTS-2 data provide some information about these differences (Newman et al., 2009; Newman, et al., 2011). Some authors have also conducted secondary data analysis with the NLTS-2 data set to provide more detailed information addressing specific research questions (Shattuck, et al., 2012). Additionally, some authors have addressed related research questions with their own independent samples (Sperry & Mesibov, 2005; Taylor & Seltzer, 2010). The following section discusses postsecondary outcomes for students with ASD, reviewing NLTS-2 data and the available literature from using other samples.

NLTS-2 data indicate that when compared to other young adults with disabilities, including learning disabilities, speech and language impairment, hearing, visual, orthopedic, or other health impairment, young adults with ASD are less likely to enroll in postsecondary school. In addition, when compared to students with these other disabilities, young adults with autism are less likely to be employed. More specifically, approximately 63% of students with ASD report having been employed at some point within eight years after high school graduation. When they are employed, young adults with ASD tend to work fewer hours per week, are more likely to hold a temporary job. These students are also more likely to report having received help from a teacher or someone at school to obtain their current job and are more likely to received accommodations in the workplace. Examining disability differences in resident independence, NLTS-2 data reveal that young adults with ASD are less likely to be living independently, have children, or have been married. Young adults with ASD are also among the disability groups to experience difficulty achieving financial independence. Similarly, young adults with ASD, intellectual disability, orthopedic impairments, or multiple disabilities were more likely to report a household income below \$25,000 than were those with other disabilities. (Newman, et al., 2011). When considered collectively, NTLs-2 data suggest that young adults with ASD as a group are far less likely than most of their peers receiving special education services to access meaningful opportunities for postsecondary education, civic engagement, employment, and peer relationships in the early years after high school (Newman, et al., 2009; Newman, et al., 2011).

Using data from the NTLs-2, Shattuck and colleagues (2012) examined the prevalence and correlates of postsecondary education and employment among youth with

ASD. Participants included 680 young adults with ASD and their families. Information regarding postsecondary employment, college, and/or vocational education was analyzed. Disparities between disability categories in postsecondary education participation and employment consistent with those reported by Newman and colleague (2009, 2011) were found. Specifically, the results indicate that over 50% of young adults with ASD were not working or attending postsecondary education two years after leaving high school. Additionally, six years after high school, 35% young adults with ASD were either unemployed or not furthering their education. These results suggest that compared to students with Speech and Language Impairment, Specific Learning Disability, or Intellectual Disability, youth with ASD had a lower rate of employment and had the highest risk of being completely disengaged from any kind of postsecondary education or employment. The authors also found youth from households with lower incomes were significantly more likely to be disengaged, even after controlling for severity of impairment. The authors suggest that this may relate to the social connectedness of parents with higher incomes, which may enable them to help their children locate work. Overall, the authors emphasize that after leaving high school students with ASD are at an increased risk for difficulty participating in higher education and obtaining employment when compared to their peers receiving special education services. The authors argue that these results highlight a potential gap in transition-planning services specifically for students with ASD, when compared to their peers receiving special education services.

Similarly, using their own sample, Taylor and Seltzer (2010) describe the occupational and daily activities for a group of young adults with ASD who had exited high school within the past five years. The authors also examined how intellectual

ability, behavioral functioning, and family income relate to the employment participation or leisure activity of the individuals in their sample. Participants included 66 young adults with ASD who exited the school system between 2004 and 2008. Overall, results indicate that there is a low rate of employment during the early transition to adulthood. Furthermore, those who were competitively employed tended to have menial jobs, and no one in their current sample had obtained full-time employment. Results from this study also suggest that a significant subgroup of the young adults in the sample, who have ASD without comorbid ID, do not participate in any meaningful daily activities. Further, when compared to participants with ASD and comorbid ID, participants without ID were three times more likely to have no daily activities. The authors conclude that these results likely do not represent a lack of abilities on the part of the students with ASD, but instead represent the inadequacy of the current service system to accommodate the needs of individuals with ASD who do not have ID as they are transitioning to adulthood. The authors emphasize the need for more *autism-focused* adult services that will allow individuals with ASD, who do not have comorbid ID, to achieve their maximum level of independence and develop sustainable careers.

Sperry and Mesibov (2005) collected data from social groups for adults with ASD to determine some of the social challenge identified by adults on the autism spectrum. Participants included 18 adults, ages 22-49, who had been diagnosed with ASD and were verbal enough to participate in the group discussion. Participants were instructed to write down one question about getting along with other people on an index card. Then, as a group, participants were encouraged to generate a possible solution for each question, while a staff member recorded this information. Four common themes were identified in

the participants' responses. Of note, was the inclusion of questions relating to relationships in the workplace. In addition to having many questions about the social context of the work environment, the authors found when asked to generate solutions to this problem, participants' focused on the development of skills in the area of social imitation and conflict resolution. Their results highlight some of the social challenges in the work place for adults with ASD, which may be particularly challenging for this population of special education students.

Overall, research demonstrates that individuals with ASD have more struggle to obtain postsecondary education and employment opportunities, even when compared to other students with disabilities (Newman, et al., 2009; Newman, et al., 2011; Shattuck, et al., 2012; Taylor & Seltzer, 2010). Additionally, when employed, the majority are poorly paid (Newman, et al., 2011) and experience social challenges in the workplace (Sperry & Mesibov, 2005). Regarding participation in recreational daily activities, research suggests that individuals with ASD without comorbid cognitive and behavioral difficulties struggle (Taylor & Seltzer, 2010). As a result, these individuals remain highly dependent on their families for financial and residential support. Many authors suggest that these findings are a result of gaps in the transition-planning process and a lack of autism-focused transition-planning services, as well as a lack of available services for adults with ASD (Shattuck, et al., 2012; Taylor & Seltzer, 2010).

Defining Transition

Special education literature has used the term transition to refer to a variety of programs and services relating to the movement of students from one phase of life to another. In the 1980's, special education began to use the term to reference the

movement of students with disabilities from school to adult life within the community. At this time, transition also began to refer to a set of federal initiatives that prepared students with disability for postsecondary employment (Halpern, 1994). Halpern (1994) modernized and expanded this view, and provided a comprehensive definition of secondary transitions for youth with disabilities:

Transition refers to a change in status from behaving primarily as a student to assuming emergent adult roles in the community. These roles include employment, participating in postsecondary education, maintaining a home, becoming appropriately involved in the community, and experiencing satisfactory personal and social relationships. The process of enhancing transition involves the participation and coordination of school programs, adult service agencies, and natural supports within the community. The foundations of transition should be laid during the elementary and middle school years, guided by the broad concept of career development. Transition planning should begin no later than age 14, and students should be encouraged, to the full extent of their capabilities, to assume a maximum amount of responsibility for such planning. (p. 116)

In addition, Halpern (1994) emphasized four major components that should be part of the transition-planning process. He discussed the importance of fostering student self-determination through an emerging sense of student empowerment, student self-evaluation, student identification of post-school transition goals that are consistent with the outcomes of their self-evaluations, and student selection of appropriate educational

experiences to pursue during high school, both in school and within the broader community, that are consistent with their self-evaluations and their post-school goals. In this work, Halpern set the stage for future focus on the operationalization of transition planning. In addition, many of these themes are still present in the transition literature today. Since, the term transition has continued to evolve, and now refers to a variety of programs and services that aim to improve the postsecondary outcomes of students with disabilities more broadly. Some argue that by taking a broad perspective on transition and offering a wider variety of services, schools, families, and services providers will be better prepared to deal with the complexity of the transition out of high school and into adult life (e.g., Kohler & Field, 2003).

This generalization is apparent in our current definition of transition. The National Secondary Transition Technical Assistance Center (NSTTAC; Test, Fowler, et al., 2009), in conjunction with the Council for Exceptional Children's Division of Career Development and Transition Publications Committee (DCT, 2014) have defined transition programs as services that "prepare students to move from secondary settings (e.g., middle school/ high school) to adult life, utilizing comprehensive transition-planning education that creates individualized opportunities, services, and supports to help students achieve their post-school goals in education/training, employment, and independent living" (Rowe, et al., 2015). Currently, the Individuals with Disabilities Education Improvement Act (IDEA) of 2018 defines transition services as a coordinated set of activities for a student with a disability that are designed to be within a results-oriented process, that are focused on improving the academic and functional achievement of the student with a disability to facilitate the student's movement from school to

postsecondary activities. These postsecondary activities can include postsecondary education, vocational education, integrated employment (including supported employment), continuing and adult education, independent living, or community participation. Additionally, the transition plan is based upon the individual student's needs, taking into account the student's strengths, preferences, and interests, and includes instruction, related services, community experience, the development of employment and other post-school adult living objectives, and, if appropriate, acquisition of daily living skills and functional vocational evaluation. (34 C.F.R. 300.43[a]; 20 U.S.C. 1401[34]).

The IDEA mandates that the individualized education programs (IEPs) for students ages 16 years and older must specify transition planning. Some states have moved this age to 14 (e.g., Virginia, Delaware, Rhode Island). According to IDEA, the IEP must include a statement of appropriate, measureable postsecondary goals based upon age-appropriate transition assessments related to training, education, employment, and, where appropriate, independent living skills. The transition services (including courses of study) need to assist the student in reaching those goals (34. C.F.R. 300.320[b] and [c]; 20 U.S.C. 1414 [d][1][A][i][VIII]).

Taxonomy of Transition Practices

Kohler (1996) provides a comprehensive, historical view of transition practices. This original taxonomy of transitions is viewed as the first creation of transition standards. In this taxonomy Kohler credits the introduction of the Bridges Model of Transition (Will, 1984) with bringing national attention to the issue of secondary education and transitions. However, at this time transition planning was conceptualized as the movement of students with disabilities from the school setting to the adult

community services system. Kohler and Field (2003) revisit the secondary transition literature and provide a framework for effective transition practices that encompasses skills needed for the variety of postsecondary outcomes now recognized in the federal legislation and the literature. Kohler and Field (2003) synthesize the best practices literature and identify five key areas for consideration: (1) student-focused planning, (2) student development, (3) interagency collaboration, (4) family engagement, and (5) program structures. In their model, self-determination is infused throughout each of the five areas. With similar concern, Kohler, Gothberg, Fowler, and Coyle (2016) build upon these earlier taxonomies by bridging the gap between theory and practice by providing concrete practices and programs for transition-focused education that come directly from the literature. As the education system has moved towards integrating evidence-based practices for all students across settings, authors have also stressed the importance of developing a variety of evidence-based practices within all of these areas to ensure that practitioners are able to meet the unique needs of all students (Wehman, 2013). As such, the majority of services and programs outlined in the current best practices literature and federal mandates can be divided into these five categories. Test and colleagues (2009) provide an exhaustive review of this literature base. Similarly, Landmark, Ju, and Zhang (2010) review this literature from a more historical standpoint. That said, it is imperative to examine this evidence-base critically. While it is promising, the literature is limited by both the amount of available research and the quality of those studies (Wehman, 2013). Kohler and Fields (2003) taxonomy is described below, with note of evidence-based practices where they exist.

Student Focused Planning

Kohler and Fields (2003) define student-focused planning as practices that include the development of student goals using relevant assessment information with an emphasis on student-focused planning activities. The authors define these as activities that require the student to exercise self-advocacy and self-awareness skills that can help the student develop and strengthen self-determination skills. In practice, this includes three major activities, IEP development, planning strategies, and student participation (Kohler, et al., 2016). In their review of the literature, Test and colleagues (2009) identify three practices with a moderate level of evidence within this area. These strategies are relatively general, and include promoting student involvement in the IEP meeting and skill instruction in self-advocacy and self-determination. Wehman (2013) suggests that the ability to be a strong self-advocate is achieved through the development of self-determination skills, and emphasizes the importance of this for students with disabilities, especially as they begin the transition process, so that they can be successful in communicating their individual needs and overcoming the challenges that they will face in life. Wehman suggests that for students with disabilities, this can be achieved in the school setting through self-advocacy programs (e.g., “Whose Future Is It Anyway;” Wehmeyer & Kelchner, 1995) and by giving the student opportunities to exercise freedom of choice in school.

Student Development

Student development practices include life, employment, and occupational skill development through school-based and work-based learning experiences (Kohler & Field, 2003). This is the area where Kohler and Field (2003) also include student

transition assessment practices. The authors suggest that engaging in these activities allows the student to apply self-determination skills. In practice, this most often includes assessment, academic skills, life, social, and emotional skills, employment and occupational skills, student supports, and instructional contexts (Kohler, et al., 2016). The large majority of evidence-based practices available, and examined in the literature, fall within this category (Landmark, et al., 2010; Test, et al., 2009). Test and colleagues (2009) identify 25 evidence-based practices within this area, two of which have a strong level of evidence. Based on their review of the literature, the majority of practices within this area focus on teaching life skills, functional academics, and leisure skills. Their review suggests strong evidence for life skills training programs. Furthermore, Landmark and colleagues (2010) discuss the extensive evidence-base available for paid and unpaid work experiences, employment preparation programs, social skills training, and daily living skills training. Their review suggests that paid and unpaid work experiences are one of the most substantiated practices to promote successful transition.

Interagency Collaboration

Kohler and Field (2003) describe collaborative service delivery as a practice that implements and integrates systems that will support lifelong learning and the needs of community members. These practices bridge the transition out of school and into adult life. They are facilitated through the involvement of community businesses, organizations, and agencies and are fostered by interagency agreement that clearly articulates roles, responsibilities, and other collaborative actions. In practice, this most often includes collaborative frameworks and collaborative service delivery (Kohler, et al., 2016). In their review of the evidence-based practices literature, Test and colleagues

(2009) did not identify any practices within this category, and highlight this as an area in need of future research. Similarly, Landmark and colleagues (2010) determine that this is the least empirically substantiated area of transition research, however their inclusion criteria identified two studies that suggest continuing employment support for six months to one year after high school results in better outcomes for students with disabilities.

Family Engagement

Family engagement practices includes family participation in the planning and delivery of education and transition services (Kohler & Field, 2003). This type of family involvement can take a variety of forms and increases family members' ability to work effectively with schools and other service providers, and vice versa. The authors emphasize that this facilitates self-determination by strengthening the link between relatedness to parents and autonomy in adolescents. In addition to family involvement in the IEP, this also includes family empowerment and family preparation practices (Kohler, et al., 2016). Wehman (2013) also recognizes the significant role that family members can play in the transition process and suggests that parents should be used as a resource and must be brought to the table early on. Similarly, Landmark and colleagues (2010) emphasize that this is an area that historically has been recognized as an integral part of successful transition, and that also has a moderate amount of empirical support. However, Test and colleagues (2009) only identified one evidence-based practice in this area that met their inclusion criteria. This practice had a moderate level of evidence, and centered on teaching parents and families about transition.

Program Structures

Kohler and Field (2003) define program structures as those programs and services that emphasize outcome-based education and expand curricular options to include community-level strategic planning, cultural and ethnic sensitivity, a clearly articulated mission and values, qualified staff members, and sufficient allocation of resources. In practice, this most often includes program characteristics, program evaluation, strategic planning, policies and procedures, resource development and allocation, and school climate (Kohler, et al., 2016). Test and colleagues (2009) identified three evidence-based practices that fall into this area, including community-based instruction, and specific outcome-based curriculum and programs.

When considered collectively, within the context of Kohler and Field's (2003) taxonomy, the majority of evidence-based transition-planning strategies focus on the area of student development (Landmark, et al., 2010; Test, et al., 2009). This includes paid or unpaid work experience, employment preparation, general education inclusion, social skills training, daily living skills training, and self-determination skills training. Additionally, family involvement has been found to be a significant contributor to successful transition planning (Test, et al., 2009; Landmark, et al., 2010). However, it is noted that there is a significant amount of variability in the nature of the research examining evidence-based transition-planning practices. While there are benefits of such varied research findings, such variability can also make it difficult to draw meaningful and consistent conclusions that generalize to other populations.

Transition Experience for Students with Disabilities

Federal legislation and mandates, and research on evidence-based practices provide a guideline to help practitioners and school staff implement effective transition services to student with disabilities. However, the experiences of individuals with disabilities often differs significantly from these guidelines (Benz, Lindstrom, & Yovanoff, 2000; Cameto, Levine, and Wagner, 2004; Hendricks & Wehman, 2009; Kohler & Field, 2003; Shogren & Plotner, 2012). The following section discusses the service delivery experience of all students receiving transition-planning services under IDEA, with special attention placed on students identified as having ASD.

Using NTLIS-2 data, Cameto, Levine, and Wagner (2004) evaluate the implementation of transition-planning practices for students with disabilities. The authors report that overall, for the majority of students receiving special education services, the most basic requirements for transition planning are achieved. However, in many instances, the actual transition services received and the goals written in students' transition plans differ. For example, while student participation in transition planning is mandated, data suggest that only about 70% of students with transition plans actively participate in the planning. Furthermore, another 6% do not attend these meetings. In addition, consistent with the literature on evidence-based practices (Test, et al., 2009) their findings indicate that community partners remain an extremely under-utilized resource. The authors also found that parents' and students' satisfaction with the transition-planning process varied when considering demographic variables including household incomes and racial/ethnic backgrounds. Specifically, findings suggest that students in the lowest household income group were less likely than those from the

highest-income group to have parents who participated actively in the transition-processes. Additionally, African American students in this sample were less likely than white students to have parent involvement, but more likely to perceive the transition-planning process as useful. Taken collectively, these results suggest that both student-focused planning and family involvement are two evidence-based components of the transition-planning process that are not consistently met for students with disabilities.

Cater, Austin, and Trainor (2011) use the NTL-2 data to examine the early work experiences of youth with severe disabilities, including intellectual disabilities, ASD, and multiple disabilities. The authors focus on work experiences obtained during high school. Their findings highlight the difficulty that students with disabilities have attaining meaningful employment before high school graduation. Specifically, these results indicate that only a small portion of youth with severe disabilities are able to access paid work experiences during secondary school. This not only contrasts with the experience of typically developing adolescents, but is also highlights a gap in the transition-planning processes, as defined by IDEA (2018) and in the literature, which emphasize the importance of hands-on vocational experiences for students with disabilities.

Exploring student and family involvement more specifically, Hetherington and colleagues (2010) aim to describe the experiences of adolescents with disabilities and their parents during the transition from high school to postsecondary education or employment. Additionally, the authors compare these experiences to federal mandates. Participants included 13 youth (10 female, 3 male) between the ages of 15 and 20 years with a variety of physical and cognitive disabilities. Additionally, six mothers and three

fathers, representing nine of the adolescents, participated in the study. The authors used a qualitative approach to explore the transition-planning process from the participants' perspective. Adolescents were interviewed individually and parents participated in a focus group. Responses to the interviews suggested that while the majority of respondents reported having been involved in an IEP meeting at some point during their school careers, 12 of the 13 participants indicated that they were not aware of having been involved in their transition planning at school. Additionally, students reported that they found the transition process to be ineffective. Parents in the focus groups consistently reported that school districts failed to engage them in the transition-planning process and several parents expressed concern that the schools were starting transition planning too late. The authors suggest that adolescents and parents perception of and experience with the transition-planning process does not match best practice research. The authors suggest that there is much room for improvement in several aspects of transition planning including increased student and parent involvement, improved relationships with school personnel, and more clearly articulated transition plans. Additionally, the authors emphasize a need for the enforcement of IDEA transition mandates. However, it is important to note that this was a small, geographically limited sample, and results may not generalize well to other populations. Additionally, it is unclear what disability categories were represented by this sample and the study utilizes qualitative methodologies.

In a similar study, Benz and colleagues (2000) examined the relationship between education and transition outcomes for students with disabilities. Specifically, the authors selected program factors and staff characteristics at community rehabilitation agencies

that are perceived by program attendees as important for achieving their education and transition goals. The authors utilized focus group procedures. Participants were selected if they received services at a site that (1) had been providing transition programming for at least four years, (2) was operating a successful program, and (3) was representative of diverse geographic regions (rural and non-rural). Among other things, their results highlight the importance of having access to supportive staff outside the school environment, who can provide student with opportunities to discuss problems with school, family, and friends, and can provide specific support for education and transition goals (e.g., one-to-one tutoring, career counseling, and independent living activities). Additionally, their results indicated that these individuals are able to assist with other issues that affect transition success (e.g., accompanying youth to court to resolve legal problems), and provide general support to problem-solve the real-life issues that arose during the early transition years after leaving school. The authors suggest that their results reflect a student's need for a personal relationship with a trusted adult during the transition process, and the value of community service providers during transition planning.

Transition Experience for Students with ASD

Cameto, Levine, and Wagner (2004) examined transition planning specifically for students with ASD. Using data from the NTLIS-2, the authors report that most adolescents with ASD had a transition plan and received instruction towards meeting their transition goals. Just more than half of plans identified the need for vocational services, where students with ASD were more likely to be working towards supported or sheltered employment rather than postsecondary education or competitive employment.

Substantial gaps between evidence-based practice and program implementation were also identified. Of note, the results suggest that few students with ASD participate in transition planning and that team member participation varies greatly. The authors emphasize that transition plans lead to success only when the educational program is appropriately designed to help students achieve their own individualized goals.

Shogren and Plotner (2012) also used data from the NLTS-2 to compare the characteristics of the transition plan for students with a primary educational classification of intellectual disability, ASD, and other disability. The authors used data from Wave one of NLTS-2 in order to provide an initial picture of the transition planning experiences of students aged 14 and older. Results of the study indicate that for all three groups, transition-planning services began at approximately the same age. Specifically, transition planning began at 14.4 years for students with ASD and other disabilities, and services began at 14.5 years for students with intellectual disability. Results also were indicative of differences in service delivery between groups. When compared to students with other disabilities, findings suggest that students with intellectual disability or ASD were significantly less likely to have primary goals related to integrated postsecondary education or employment (i.e., college, vocational training, and competitive employment). However, these students were more likely to have primary goals related to functional independence and social relationships. Differences between students with ASD and intellectual disability were also observed. Specifically, students with ASD were significantly less likely than students with intellectual disability to have goals related to competitive employment and living independently. In regard to the transition-planning process, students with intellectual disability and ASD had significantly lower

levels of participation compared with students with other disabilities, and students with ASD were the least likely to attend their meetings. Students with other disabilities were significantly more likely to provide input or lead their transition planning than were students with ASD or intellectual disability. Additionally, students with ASD were much less likely than students in other disability categories to be characterized as active participants. The authors suggest that while it appears schools follow the transition mandates of IDEA; a closer evaluation of the data reveal that this is not always the case. The authors argue that for a large number of students in our nation, limited consideration is given to individualizing programs of study based on a comprehensive understanding of the student's interests, preferences, and desired post-school outcomes. Despite the emphasis on student involvement in transition planning reflected in IDEA and best practice recommendations, the results indicate that a very small number of students with any disability label take a leadership role at their IEP meeting, and that significantly fewer students with intellectual disability or ASD take a leadership role than do students with other disability labels. The authors suggest that their results also support previous findings that a significant numbers of students are not prepared to effectively participate in the IEP meetings (Agran, Blanchard, & Wehmeyer, 2000).

Hendricks and Wehman (2009) provide a review of the research related to the transition from school to adulthood for youth with ASD. The authors aim to provide insights into the transition process and help identify needed service delivery and intervention for this subset of the special education population. The authors reviewed articles published from 1996 to 2008. In order to meet inclusion criteria, at least 50% of the participants in the sample had to have an educational classification of ASD and be

above the age of 13. Many of the studies reviewed examined instructional strategies, and focused on topics such as behavior reduction programming, language development, and literacy. Very few studies included any discussion of targeted job skill development. Based on their examination of the research, the authors conclude that the majority of transition plans for adolescents with ASD focus on employment-related goals and living skills. A smaller subset of transition plans included goals related to attending a two-year or four-year college. Importantly, the skills required to be successful in these environments were often not represented in the transition goals. Consistent with previous research (e.g., Heatherington, et al., 2010), the authors suggest that this provides further evidence that transition plans for students with ASD fall short of federal mandates. It is important to note that it is possible that the inclusion criteria utilized in this study were too narrow and too few studies were included to get a representative description of the transition process for all students with ASD.

Anderson, Lupfer, and Shattuck (2018) utilize qualitative research methods to explore the processes that lead to poor postsecondary outcomes for young adults with ASD. Additionally, the way in which these outcomes differ based on the individual's cognitive ability, behavioral-psychiatric issues, and level of social impairment was considered. Participants included 20 young adults with ASD who had left secondary school within the past 15 years and been awarded a diploma or certificate upon high school completion. Interviews were conducted with the participants and their parents, usually in the participant's home. In addition, parents were asked to complete a complementary questionnaire that provided information about family demographics, diagnosis, high school setting and current services. Results suggest that most parents perceived the

change of service that accompanies the end of their child's public school education as abrupt and overwhelming. Difficulty accessing adult services was a concern for the majority of participants and their parents. This was especially true for students who exited high school before they reached 21 years of age and were therefore ineligible for the majority of adult services that become available at that time. Additionally, often these programs were not adequate in meeting the unique needs of young adults with ASD. Furthermore, those with higher IQ's often did not qualify for services, despite significant social and mental health needs. For those pursuing postsecondary education, results suggest that students were often underprepared for the demands of college and that colleges often did not have the supports necessary to meet the social, behavioral, and executive functioning needs of students with ASD. The authors concluded that poor postsecondary outcomes reported for young adults with ASD (e.g., Newman, et al., 2009; Newman, et al., 2011; Shattuck, et al., 2012; Taylor & Seltzer, 2010) occur because young adults on the autism spectrum have multiple social, mental health, and behavioral needs that are not accounted for by cognitive ability alone. Supports for these unique needs are often not available after the student exits the public education system, leaving families to fill in these gaps. However, this study was limited in that it included a small sample of young adults with ASD, primarily from white, affluent families.

When considering the transition experiences of all students with disabilities, there are areas where practice clearly falls short of federal mandates and best practices. Data from the NTLS-2 suggests that the actual services received by all students with disabilities and the goals in their transition plans often differ, predominantly in the area of student participation and family involvement (Cameto, et al., 2004; Hetherington, et al.,

2010). It comes as no surprise that this is also the case for students with ASD (Cameto, et al., 2004; Shogren & Plotner, 2012). When all students with disabilities are considered collectively, postsecondary job placement, postsecondary education, and independent living are prioritized in the transition plan more than the skills that will support success in these environments, like social skills and interpersonal relationships (Cameto, et al., 2004). While evidence suggests that students with ASD are more likely than students with other educational classifications to have goals related to functional independence and social success (Shogren & Plotner, 2012), even this group falls short (Hendricks & Wehman, 2009). Adults with ASD experience particular difficulty accessing adult services, likely due to social, mental health, and behavioral needs that are not accounted for by cognitive ability alone (Anderson, et al., 2018). In addition, more can be done to include community partners early on in the transition-planning process (Benz et al., 2000; Cameto, et al., 2004).

Considerations in Transition Planning For Students with ASD

Overall, the available literature on evidence-based transition-planning practices is limited (Wehman, 2013). An even smaller percentage of these studies examine the factors that predict postsecondary success for students with ASD separate from other disability categories. Those that do are often descriptive and few make recommendations for practice (Wehman, et al., 2014). This further limits that application of the evidence base for this unique population. In addition, research demonstrates that postsecondary transitions for students with ASD are particularly inadequate (Shattuck, et al., 2012). Therefore, identifying key elements of the transition-planning process that meet the unique needs of this population, is an area in need of more research.

Wehman (2013) expands on the evidence-based transition services literature by suggesting ways in which educators can apply these theories for the increasing population of high school age students with ASD. In this theoretical work, Wehman (2013) urges educators to use a synthesis of available research (e.g. (Kohler & Field, 2003; Test et al., 2009)) when making curricular and transition decisions for students. However, he notes that the available literature is not adequate in ensuring success for all students with disabilities, and recommends that other avenues be considered. Overall, Wehman (2013) emphasizes the importance of including input from students and their families, finding places in the daily curriculum to incorporate skills required for success in the workforce, and ensuring that students receiving special education services have adequate opportunities to be included in their school community.

Wehman and colleagues (2014) provide an overview of the current transition planning literature for students with ASD, highlighting the literature on traditional high school curriculum and its impact on postsecondary outcomes as well as transition focused education options for these students (Wehman, et al., 2014). The authors emphasize that students with ASD have significant strengths that have traditionally been underappreciated. Considering their review, the authors make several recommendations for future policy and for practice. Specifically, they recommend that schools and community programs must collaborate earlier, more frequently, and more effectively. Similar to the recommendation made by Wehman (2013), Wehman and colleagues (2014) emphasize that these partnerships must include students with ASD and their families. They also recommend that we set high expectations for students with ASD and advocate for their placement into competitive employment. Regarding high school

curriculum and services specifically, the authors recommend increased education and involvement in transition planning and self-determination. Wehman and colleagues (2014) also emphasize that curriculum should focus on postsecondary outcomes. In addition to advocating for inclusion practices, the authors call for a shift from the current overreliance on nonacademic/non-vocational coursework to a curriculum that emphasizes vocational and/or academic work. They also emphasize the need for structured social skills instruction to support the social inclusion of students with ASD and they identify the need for increased use of paid employment with intensive job coaching and support before students leave high school (e.g., Carter, Austin, & Trainor, 2011). For students looking for postsecondary education options, the authors recommend dual enrollment programs that would allow students with ASD to participate in two-year and four-year colleges while still under the supports of their IEP (e.g., Hart, Grigal, & Weir, 2010). Finally, the authors recommend that educators provide systematic instruction to youth with ASD in functional literacy, community independence, and self-determination.

Schall, Target, and Wehman (2013) discuss the unique transition planning needs of student with ASD. The authors note that while these students often graduate with the academic skills needed to be successful after high school, there is a lack of specialized instruction in social communication and functional living skills that are needed to be successful in higher education and employment settings. Additionally, this may make it difficult for students with ASD to attain other markers of success, such as financial independence and independent living. Among other things, the authors discuss the need for explicit social skills and communication instruction. They also recommended that school-based personnel analyze behavior and use this information to develop an

individualized positive behavior intervention plan. The need for frequent communication between school and community-based service providers was also discussed. Finally, the authors emphasize that regular data collection for these transition focused goals is needed not only to ensure the success of the plan, but also to monitor the fidelity of the implementation of these interventions.

In 2014, the Health Care Transition Research Network (HCT-RN) for Autism Spectrum Disorder and other Developmental Disabilities was established to advocate for research that will improve health care transitions and promote successful postsecondary transitions for young adults with ASD. Shattuck, Lau, Anderson, and Kuo (2018) discuss the development of the HCT-RN and related research agendas. Scoping review methodologies were used and five gaps in the existing research were identified, including: limited understanding of social-ecological determinations of transition outcomes, lack of longitudinal studies that focus on outcomes for young adults with ASD, small sample sizes, frequent use of qualitative research methods, and lack of generalizability of results were identified as limitations of the current research base. They emphasize that the inclusion of social-ecological variables is necessary for the development of interventions beyond the individual child level.

Kucharczyk and colleagues (2015) utilize qualitative research methods to evaluate the contextual factors associated with delivering evidence-based interventions that meet the transitional needs of students with ASD. Focus group data were collected from four states and included parents, educators, administrators, related service providers, and community members who had experience with high school students with ASD. A total of 152 participants attended the 28 focus groups. Their results suggest that for the most

part schools are perceived as inadequately addressing the educational needs of students with ASD and an overall absence of efforts in high schools was noted. Systems that were more successful in addressing the needs of students with ASD often utilized a team approach, where team members included a wide variety of services providers and where general educators play a prominent role. Structured and formal programs, such as peer supports, peer buddy groups, and other orientation events, were also cited as helpful. Concerns about time, effort, staffing issues surrounding the implementation of individualized interventions were identified as barriers to successful transition programming. Similarly, because there is such a wide variety of ability within the autism spectrum, participants recognized that a “one-size-fits-all” approach is inadequate but often the only feasible option for school staff. Participants identify a significant need for awareness of ASD and the related abilities and needs in schools, with additional, more focused, professional development and training for general education teachers. The authors concluded that these results highlight the need for rigorously elevated intervention practices at the high school level that are designed for students with ASD and address the diverse needs of students within this disability category. Similarly, given the wide variety of service providers working together to plan for the transition, it is imperative for these service providers to identify ways to work collaboratively. Finally, the authors emphasize the need for both school-wide professional development and targeted training for general education teachers to ensure basic awareness and understanding of ASD.

Holwerda, van der Klink, Groothoff, and Brower (2012) conduct a systematic literature review investigating the prognostic factors associated with employment

participation of young adults with ASD. Studies that evaluated social outcomes broadly, including employment and reported on work outcome specifically were included in their review. In total 18 articles met their criteria. Results indicate that intelligence level was the only consistent, significant predictor of employment. Functional independence was also a somewhat consistent predictor across studies. Inconsistent predictors included diagnosis, severity of disorder, gender, language ability, and maladaptive behavior. Comorbidity, social impairments, lack of drive, parental support, family income, mental illness of parents, family dynamics, use of medication, and schooling were found to be non-significant predictors. The authors emphasize that the significant predictors that they identified are important for all individuals, with or without autism. For individuals with ASD, Holwerda and colleagues suggest that it may be important to consider how the combination of these factors affect employment outcomes.

Schall and Wehman (2009) identify eight practical guidelines for excellent transition programs for students with ASD. The authors recommend: (1) providing systematic, structured instruction that results in student engagement and skill development, (2) designing and using environmental and organizational supports that make expectations, schedules, and environments clear, (3) providing specialized education in social communication skills that will increase the students' success at work, home, and in their community, (4) identifying the function of problem behavior and developing behavior intervention plans that teach replacement skills rather than utilizing only plans that suppress problem behavior, (5) ensuring that functional life and community skills that are necessary for student's long term success are taught along with required academic skills, (6) ensuring generalization of skills from school-based

environments to community, home, and work environments, (7) involving families in the transition process, including educating them about the transition process and the roles adult agencies can play in the life of their student, and (8) coordinating connections with adult service agencies to ensure a smooth transition from school to work. While a number of these themes overlap with those identified by Kohler and Filed (2003), those that are unique, and have been identified by other authors as important for students with ASD (Schall, et al., 2013; Wehman, 2013; Wehman, et al., 2014) warrant particular attention when transition planning for student with ASD.

While it is largely theoretical in nature (e.g., Schall, et al., 2013; Shattuck, et al., 2018; Wehman, 2013; Wehman et al., 2014), the available literature that evaluates transition-planning services for students with ASD points to the need for intervention strategies and policy that meets the unique needs of this growing special-education population. Results of studies using qualitative methodologies (Kucharczyk, et al., 2015) and those that focus on conducting a systematic review of the literature (Holwerda, et al., 2012) identify a wide variety of individual, family, school, and community variables that must be considered when developing and implementing an adequate transition plan that meets the social and communication needs of students with ASD. When considered collectively, social skills instruction, inclusion in the general education curriculum, and the use of positive behavioral supports are three school-level strategies that are mentioned across studies.

Difficulty with social interaction is a core feature of ASD. Additionally, social and communication difficulties are cited as one of the most frequent reasons individual with ASD are fired from jobs (Müller, Schuler, Burton, & Yates, 2003). Landmark and

colleagues (2010) identify this as one strategy with a substantial evidence-base for all students with disabilities and Test and colleagues (2009) review a number of studies within the area of student development that have a strong evidence base in supporting participation in postsecondary education and improving employment outcomes.

Furthermore, Schall and Wehman (2009) highlight the need for specialized education in social communication for students with ASD preparing to transition out of school. These students are also more likely than their peers receiving special education to have primary goals related to social relationships (Shogren, & Plotner, 2012). Social competence largely impacts success in the workplace, at home, and in the community (Carter, Harvey, Taylor, & Gotham, 2013). Given that these are core deficits associated with ASD, and that these skills increase the likelihood of post-graduate success for all high school students, it is imperative that special educators include social skills training in the transition plan for students with ASD.

Wehman (2013) suggests that schools should emphasize the skills and competencies related to employment rather than solely focusing on isolated academic skills. Explicit instruction in what Wehman refers to as “soft skills” (e.g., how to interact with supervisors and co-workers, how to adaptive to changes in the work environment, etc.) is a significant area of need for students with ASD because it aligns with one of the core weaknesses associated with the diagnosis. It is theorized that this type of instruction will positively impact all outcomes associated with successful postsecondary transitions, success at work, at school, at home, and in the community (Carter & Hughes, 2013; Schall, et al., 2013; Schall & Wehman, 2009). Additionally, explicit social skills instruction also increases the student’s ability to self-manage their own behaviors, which

in turn promotes greater independence across settings and enables them to participate in shared activities with peers and co-workers (Carter & Hughes, 2013).

There are three primary approaches to supporting the development of social skills in adolescents with disabilities (Carter & Hughes, 2013). Specifically, Carter and Hughes (2013) identify student-focused strategies, peer-focused practice, and support-focused practices. Student-focused strategies are those that teach students specific skills and dispositions that positively affect the quality of their social interactions. This includes social skills training, explicit instruction in discrete skills (e.g., initiating conversation, turn taking, etc.) and explicit instruction in clusters of skills (e.g., cooperation skills). Peer-focused strategies are aimed at classmates, co-workers, or other community members and provides them with the skills needed to confidently interact with a student with a disability in a social atmosphere (e.g., peer tutoring, peer interaction training, etc.). Similarly, support-focused strategies provide these type of skills for adults interacting with individuals with disabilities (e.g., adult facilitation, environmental modifications, etc.). The authors recommended that multidisciplinary teams work to combine elements of these student-, peer-, and support-focused strategies when creating social goals and programming for students with disabilities.

Research demonstrates that inclusion in the general education classroom correlates with better post-school outcomes for students with disabilities (Landmark, et al., 2010). Wehman (2013) also highlights the importance of including students with disabilities in the general education classroom. This provides the opportunity for students with ASD to access to the general education curriculum while also creating an opportunity for these students to meet and establish friendships with their peers. In

addition, inclusion in the general education setting provides students with ASD more opportunities to participate in extracurricular activities. As such, inclusion plays an integral role in the transition plan for students with ASD because many of the unique needs of these students can be addressed in this environment. However, no research to date has explored the experiences of students with ASD in inclusive high school settings in the United States (Wehman et al., 2014). Therefore, practitioners are only able to draw conclusions from data that support the inclusion of these students during their elementary school years and data that support the inclusion of all students with disabilities at the secondary level.

It is also important to consider inclusion outside of the context of general education classroom. For example, Carter and colleagues (2010) suggest that the available research indicates that transition-planning teams may underutilize the role of extracurricular involvement as part of the transition plan for students with disabilities. They emphasize that, in addition to ensuring that students are taught the skills needed to support social interaction, school staff should also attempt to provide these types of extracurricular opportunities to students with disabilities. Community-based instruction is another way students with ASD can experience the benefits of inclusion in a vocational setting. This practice has been empirically validated as a strategy that supports post-school employment and education success for students with disabilities (Mazzorri, Test, & Mustian, 2014).

In their review of the available literature, Wehman and colleagues (2014) discuss the traditional high school curriculum and its impact on postsecondary outcomes and transition-focused education practices for students with ASD. Their review highlights

some significant differences in the high school experience when students with ASD are compared to other students with disabilities and when compared to their typically developing peers. Using this information, the authors recommend some changes to the high school curricula and services will better meet the unique needs of this population. They authors note that data that support participation in nonacademic and vocational coursework also relates to the finding that students with ASD often have more transition goals geared towards social skills and the development of interpersonal relationships. They are cautious in this recommendation, however, and suggest that it may not result in the desired postsecondary outcome given that when these students are included they appear to participate less than their neuro-typical peers (Newman, 2007). The authors also note that high school students with ASD typically earn double the number of credits as their peers without disabilities, and 1.74 times more credits than their peers with other disabilities. Most of this is a result of their increased participation in learning support courses. Wehman and colleagues (2014) suggest that because of this, students with ASD are sacrificing academic credits in favor of non-academic, vocational credits, when data also suggest that these students are often able to handle the academic demands in more inclusive settings. Ultimately, the authors urge practitioners to support the inclusion of students with ASD in more rigorous academic and vocational courses, in the general education setting where possible. They also emphasize the need for increased participation in internships and employment during high school. The authors hypothesize that increased social inclusion, in neighborhood high schools and job settings, will complement more structured social-skills instruction and further support these students in acquiring the “soft skills” necessary to be successful in postsecondary environments.

Often, students with ASD display excessive resistance to change, and highly restricted, fixated interests that are abnormal in intensity or focus. Individuals with ASD may be overly dependent on routines and highly sensitive to changes in their environment. As these students age, this can also interfere with their ability to regulate their emotional responses, which may present as challenging behavior in the work environment (Schall, et al., 2013). Given these challenges, Schall and Wehman (2009) emphasize the need to identify the function of problem behavior and develop behavior intervention plans that teach replacement skills as an aspect of the transition plan that needs to be emphasized for students with ASD. These authors identify implementing positive behavior supports to address behavioral challenges as a practice needed when transition planning for students with ASD. It is theorized that these strategies will not only help students be better prepared for the work environment, but will also facilitate their inclusion in the general education setting while in secondary school. However, few studies have examined this as a predictor of postsecondary success.

Summary

In summary, when considering the best practices literature for transition for students with ASD, the majority of the available research focuses on post-school outcomes and school-based services for all students receiving special education (Cameto, et al., 2004; Cater, et al., 2011; Hetherington, et al., 2010; Shogren & Plotner, 2012). Few studies have provided a national picture of the extent to which the indicators of best practices are experienced by students with ASD and their families. Although findings from studies of predictors of post school outcomes for youth with all disabilities have the potential to be extended to youth with ASD, an analysis of the relationship between the

recommended best practices and post school outcomes is warranted given the unique characteristics of this population (Anderson, et al., 2018; Hendricks & Wehman, 2009; Wehman, 2013) and more research is needed to explore the connection between school program variables and postsecondary outcomes for students with ASD. Furthermore, given the large theoretical and empirical research base reviewed, there are many significant factors associated with successful postsecondary transition for students with ASD that are evidence based but may be difficult to implement with fidelity in the school setting. This is true for all students with disabilities (Cameto, et al., 2004). However, many of these intervention strategies are the ones that are most important in promoting the successful transition of students with ASD (Schall, et al., 2013; Schall & Wehman, 2009; Wehman, 2013; Wehman, et al., 2014). Of particular note is the focus on interpersonal skills (Carter & Hughes, 2013), through both direct instruction and exposure to inclusive settings (Wehman, et al., 2014), and positive behavioral support interventions (Schall & Wehman, 2009). These strategies are vital, given that they not only support successful postsecondary transitions for all students, but that they also address the core deficits associated with ASD. In addition, there is significant evidence to suggest that factors such as gender, ethnicity, disability, household income, and location of the school attended by the youth (e.g., urban, suburban, rural) relate to the likelihood that a student will have access to a school setting that provides some of these best practices (Benz, et al., 2000; Cameto, et al., 2004). These factors should also be considered within the population of students receiving school-based services for ASD.

The current study seeks expand on the current literature by exploring the relationship between school program variables and post-school outcomes for students

with ASD using a nationally representative sample and considering the impact of student and family characteristics on this relationship. Specifically, using data from the NTL-2, the current study seeks to determine (a) whether student, family and school characteristics predict post school outcomes in education/training and employment for students with ASD and (b) whether school program variables that are indicative of best practices will predict these same postsecondary outcomes over and above the aforementioned student and family factors.

CHAPTER 3

METHODOLOGY

The current research study used data from the National Longitudinal Transition Study – 2 (NLTS-2) to answer the descriptive, comparative, and predictive research questions. This chapter begins with an overview of the NLTS-2, including the study design, methods, and instruments. After this review, this chapter describes the sample, model for analysis and included NLTS-2 variables, missing and conflicting data procedures, data preparation procedures, and statistical analysis procedures.

NLTS-2 Overview

The NLTS-2 was intended to provide a national description of the experience and achievement of young people as they transition to adulthood. The research initiative was commissioned in 2001 by the U.S. Department of Education, OSEP (2001-2011), and the Institute of Education Services (U.S. Department of Labor, 1997) as part of the national assessment of the 1997 IDEA. The NLTS-2 was designed to evaluate secondary school experiences in the transition to adult roles for secondary-aged youths with disabilities. It focuses on youth, youth characteristics, services that are provided to the youth, and outcomes that they achieve to evaluate at the implementation of the law. The nationally representative sample includes over 500 school districts and 40 special schools, primarily for students with visual or hearing impairment, from across the United States. A total of 11,272 students, at 13-16, are included in the NLTS-2 sample. Each of the 13 federal disability classifications in IDEA are represented in the sample. Students were followed for nine years, and information was collected at five-time points, in two-year waves, over ten years.

NLTS-2 data provide postsecondary education, employment, independence, and social information for secondary school students who received special education services up to eight years after high school completion. Data were collected from the youth themselves, their parents, and school staff. NLTS-2 data are intended to generalize to youth who receive special education services by age group and by each disability category and each single year age cohort separately. Data were stored at the youth level because this is a youth-focused study. For this reason, it is possible to draw generalizations about students and youth from the NLTS-2 data, but not possible to use this data to generalize to families, communities, schools, teachers, or classrooms.

The NLTS-2 utilized stratified random sampling procedures to ensure that the results generalized to the whole population of students receiving special education services under IDEA. Developers sampled in two stages. During the first stage, a random sample of local education agencies (LEA) providing services to students ages 14-16 years who were in 7th grade or above were selected from all school districts in the United States. This sample of districts was then stratified to represent different geographic regions, sizes, and socioeconomic statuses. During the second stage, students were randomly selected from each LEA. Approximately 1,000 students from each IDEA disability category (e.g., autism, deafness-blindness, emotional disturbance, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, specific learning disability, speech and language impairment, traumatic brain injury, and visual impairment) were sampled to ensure adequate representation of each of these disability categories. In addition, students were disproportionately sampled by age to ensure that there would be an adequate number of

students who were age 24 or older at the end of the study. Sample weights were then calculated to ensure that this sample accurately represented the proportion of students within each of these disability categories receiving special education services within the United States. A total of 11,272 students were selected and eligible to participate in the NLTS-2. It is crucial to note that students who were in a school district but were not attending a regular or neighborhood school who may have been placed in a special school or program were also included. Most of the data within the NLTS-2 were collected longitudinally from a range of different data sources, including parents, youth, teachers, and school administrators. Information about school program characteristics was evaluated from Waves 1 and 2.

Sample

All students from the NLTS-2 data set who had a primary disability diagnosis under one of the 13 disability categories in IDEA were included in the study. Students with a primary school district classification of Autism Spectrum Disorder (ASD) were the group of interest for the current study and were compared to students with all other educational classifications. It is important to note that to determine eligibility for each special education category school districts do not use the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5) criteria. Instead, the U.S. Department of Education and IDEA (2018) use a broader definition for each category. As such, students in this sample meet criteria for ASD under the IDEA Part C classification, which defines ASD as “a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three that adversely affects a child’s educational performance” (IDEA, 2018). Within

this definition, other traits of ASD include, “engaging in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences” (IDEA, 2018). Also, criteria for the classification of ASD are not met if the child’s educational performance is not adversely affected. For this reason, it is important to note that findings from this study only generalize to children classified with ASD by their school district and who receive special education services.

In the NLTS-2 data, disability was determined by the school district and parents’ reports. SRI International also created variables in each wave that combined both the district designation and parent report so that youth was identified as having ASD if either the district or parent-reported that youth had been diagnosed with ASD in either Wave 1 or Wave 2. For the present study, all variables, including those created by SRI, were examined for their fit with the current research questions and statistical analysis. Ultimately, students were grouped using the created variable from the Wave 1 Parent Interview Data. This variable was created by SRI International and is a combination of parent-reported diagnosis and confirmed district classification. Approximately 922 students from the NLTS-2 sample meet these criteria. However, the sample size varies for each item and instrument. The sample size becomes more limited in later waves, ranging from approximately 657 to 405 during wave 5 of the NLTS-2.

Model

Each NLTS-2 variable was identified as a school program variable, school characteristic, classroom characteristic, student characteristic, family characteristic, or postsecondary outcome, as indicated in Figure 1 below. As Figure 3.1 illustrates, it was

hypothesized that school program variables would lead to postsecondary outcomes, while school characteristics, classroom characteristics, student characteristics, and family characteristics would moderate this relationship. Additionally, it was expected that school characteristics, classroom characteristics, student characteristics, and family characteristics might covary. For example, students from families in higher-income ranges may attend a different type of school than students whose families have a lower annual income. Additionally, it is worth noting that the literature suggests family, individual, and school variables are related to postsecondary outcomes regardless of whether or not a student has access to best practice school program variables, which is also illustrated in Figure 3.1.

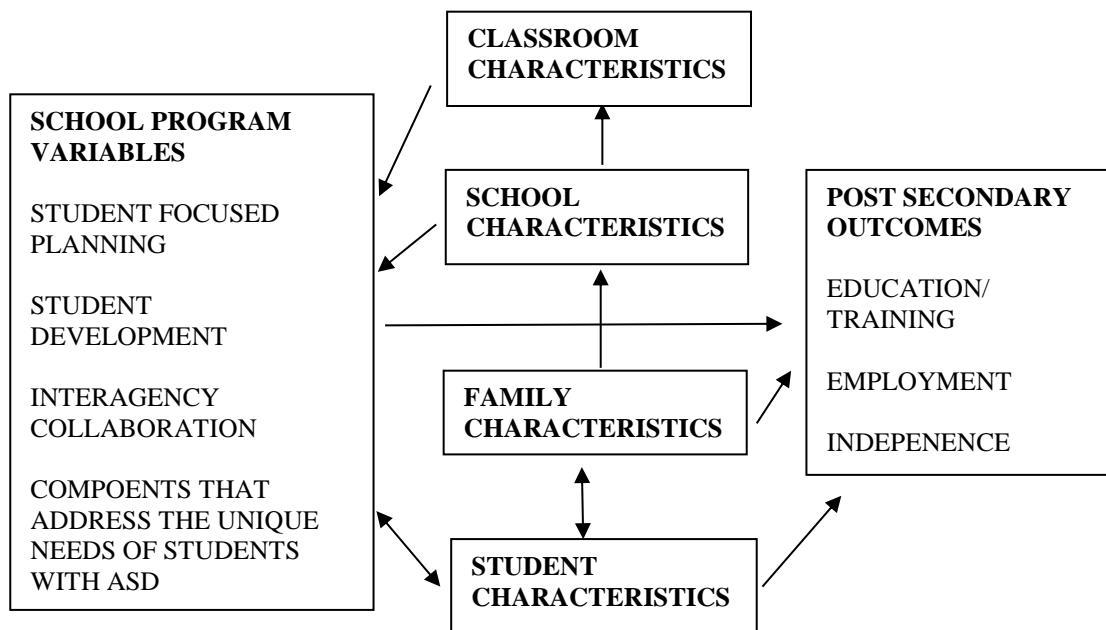


Figure 3.1 Original Model.

After some initial data analysis, it became clear that missing data, which was likely due to a combination of factors that are typically problematic for voluntary surveys, would limit the ability of the current study to evaluate the relationship between

school program variables and postsecondary outcomes in the way that the researcher initially intended. Missing data impacted not only the moderating variables but also the possible outcome measures. For this reason, after some initial analysis, the original model was modified to reflect what could be evaluated using the available and representative data of the larger population. This model is depicted in Figure 3.2. Again, it was hypothesized that school program variables would lead to postsecondary outcomes. However, postsecondary education and employment became the primary focus of the analysis. It was believed that school characteristics, classroom characteristics, student characteristics, and family characteristics would moderate this relationship. However, the possible variables of interest were simplified from the original model. It was still expected that school characteristics, classroom characteristics, student characteristics, and family characteristics might covary in the same way that the original model describes.

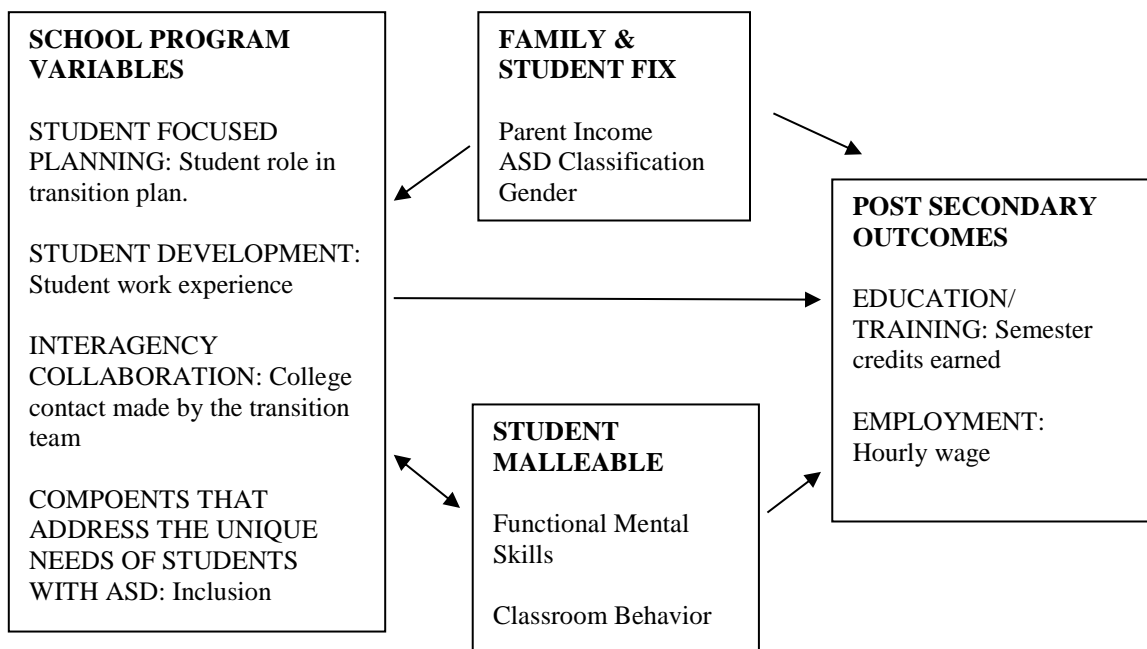


Figure 3.2 Final Model.

NLTS-2 School Program Variables

For this study, data from Wave 1 and Wave 2 were used to evaluate the student's school program. Variables from the School Characteristics Survey and School Program Survey were considered for inclusion. Data from Wave 1 were collected in 2002. Data from Wave 2 was collected in 2004. The School Characteristics Survey data were collected from a school staff member (usually a principal) who could report on the characteristics and policies of the school. The School Program Survey was completed by the teacher with the most knowledge about the student's educational program and included questions about all aspects of the student's school program, including a section on the transition to adult life. Often, this was a special education teacher. Additionally, variables on transition supports and services collected through the Parent Telephone Interview were also considered for inclusion. Specifically, the section on family interaction and involvement in the IEP and parent perceptions of the usefulness of planning for life after high school was considered for use in this portion of the analysis. Ultimately, school program variables were derived only from the School Program Survey.

Independent Variable Selection

Specific NLTS-2 variables were selected based on their alignment with thematic findings regarding the traditional transition planning practices (e.g., Kohler, 1996; Kohler & Fields, 2003; Wehman, 2013) associated with post-school outcomes identified in the review of the literature conducted in Chapter 2. Studies included in the literature review focused on the five transition practices initially identified by Kohler (1996) and then expanded by Kohler and Fields (2003), including (1) Student Focused Planning, (2)

Student Development, (3) Interagency Collaboration, (4) Family Engagement, and (5) Program Structure. Additionally, Wehman (2013) and Wehman and colleagues (2014) explore components of the transition plan that address the unique needs of students with ASD, including social skills, inclusion in the general education setting, and the use of positive behavioral supports. These independent variables include information about the school program. For moderating variables, items from the Parent and Youth interviews that provide information about the youth and family and information from the School Characteristics Survey that provided demographic information about the schools were considered for inclusion in the analysis. For certain variables, a precise match can be seen between the factor of interest and the variable in the NLTS-2. For example, gender was a factor of interest and also a variable in the NLTS-2.

However, for other variables, notably many of the school program variables, the variable in the NLTS-2 is an indicator of whether this variable occurred. For example, the NLTS-2 variable “student is enrolled in an academic class in the general education setting” indicates that the student participated in the general education curriculum, a variable that aligns with the best practices research. To create these variables, some recoding of the NLTS-2 was necessary. Table 3.1, located in Appendix A, includes the final list of variables considered for use in the regression equation based on their relation to the themes presented in the literature review, percentage of data available for the analysis, and intercorrelations. Preference was given to variables that were correlated moderately with the outcome variables and had low intercorrelations.

Outcome Measures

For this study, data from Wave 5 of the NLTS-2 was used to evaluate outcomes. Data from Wave 5 were collected from Parent and Youth Surveys conducted in 2009. Data from the Parent and Youth Survey were collected through telephone interviews with parents/guardians. The telephone interview began by identifying the adult who was most knowledgeable about the youth. At the end of the interview, this adult identified whether the youth could answer survey questions. Youth identified as capable of responding were interviewed by telephone. Mail questionnaires were administered to families who could not be contacted by phone. For this data collection method, the youth was always the preferred respondent.

Parent/guardian responses were used under certain conditions, including instances when permission to interview a youth younger than 18 was denied, when the parent/guardian indicated that the youth was not capable of completing an interview or a mailed questionnaire, or when the youth could not be reached to complete a survey. The youth interview and the youth mail questionnaire data were integrated into a single youth item for each question. Likewise, the parent/guardian data were integrated into a single item for the corresponding question from the Computer Assisted Telephone Interview (CATI), the abbreviated interview, and the mail questionnaire. Additionally, a combined variable, which included information from the youth respondent if available and the parent respondent if the youth item was not answered, was created by SRI International. The current study selected these combined parent/youth responses for analysis.

Information about youth and family characteristics, non-school activities, satisfaction with school programs, and activities after high school was collected through the parent and youth surveys. Initially, outcome measures of interest were educational

and social success measures such as employment, postsecondary education, independent living, social inclusion (e.g., youth or parent ratings of the youth's social interactions), and financial independence. Estimates reflect prevalence during the period since leaving high school. Quality of life variables were also considered. While these data were not directly measured comprehensively by the NLTS-2, available data that can be indicative of the quality of life (e.g., youth ratings of their enjoyment of life) were considered. Again, after some initial data analysis, it became clear that missing data in the NLTS-2 data set would limit the ability of the current study to evaluate the relationship between school program variables and postsecondary outcomes in all of these domains.

Missing data were problematic for all outcome measures of interest in wave 5. However, measures that reflected independent living, social inclusion (e.g., youth or parent ratings of the youth's social interactions), financial independence, and quality of life were particularly problematic because missingness was not evenly distributed across groups (ASD vs. Other). For this reason, the study focused solely on education and employment outcomes.

Missing and Conflicting Data

NLTS-2 data collection occurred in waves, and multiple respondents were asked to report on a single student. Multiple data sources allow for the possibility of triangulation, allowing researchers to dig deeper into the study data that were initially intended to provide information about a breadth of topics but with less depth. However, in some instances, it can result in missing or conflicting reports. For example, within a wave, a youth may have one or more data sources, but not necessarily all sources. Similarly, a youth may have data for a given source in one wave but not in another across

waves. Multiple sources of data also create discrepancies. For example, a parent and youth may have responded differently to similar items (e.g., youth may report that they graduated where the parent reports that they actually tested out to get a diploma).

Additionally, data may be entirely missing for a given source in instances where a school had no record of the student's attendance. Finally, typical concerns regarding missing data for a voluntary survey also apply to the NLTS-2, where respondents may have refused to complete a questionnaire or participate in an interview, may have intentionally or unintentionally skipped items, terminated the interview before it was complete.

For this reason, the number of respondents across and within waves was monitored when conducting the analysis. In addition, for some measures, including the School Program Survey and School Characteristics Survey, two different versions of the survey were distributed, one to the school districts and another to the special schools, primarily for use with visual or hearing impairment, included in the study. Data from these two sources were integrated into a single data file for each wave by SRI International. As a result, common items may have had different question numbers in the questionnaire, and some items were not the same across versions. For this reason, data were missing if the question was not included in the version completed by the respondent.

Missing data presents several problems that are not easily resolved. While removing missing data appears to be a simple solution, this would have reduced the sample size to the point that would substantially limit the ability of the current research study to generalize to the actual population of students receiving special education services with an IDEA classification of ASD. For these reasons, the treatment of missing data in the current study was determined after some initial data analysis. When possible,

variables were excluded from the analysis when more than 10% of the data were missing. However, missing data were so pervasive in the School Characteristics Survey, School Program Survey, and Teacher Survey that it would not have been possible to include any variables from these measures using this criterion. All three of these measures were completed by school personnel. During NLTS-2 data collection, the Teacher and Program Surveys had the lowest response rates, ranging from 36-57 percent. Excluding this information entirely would have negatively affected the generalizability of the results because, without data from these measures, the actual experiences of students in schools would not be represented. For this reason, missing data were evaluated across groups when a variable derived from one of these measures related closely to the purposed model. In these instances, the variable was included in the study only if missingness was consistent across groups. More specifically, if a variable had more than 10% of data missing overall, but the percentage of missing data between groups was less than 5%, the variable was included in the analysis. Conversely, if this missing data between groups exceeded 5%, the variable was excluded. From that point, listwise deletion was used to eliminate missing data in the analyses.

Sample Weights and Weighted Standard Errors

The NLTS-2 stratified sampling procedure was conducted in a manner that ensures that precise results could be obtained for each of the disability categories. For this reason, often the unweighted sample is not reflective of the proportion of these students in the general population. Similarly, some variation in the characteristics of respondents exists between each data collection activity and each data collection round. In a multi-stage sample like the NLTS-2, where youth were selected from within districts

and within schools, it can be assumed that observations are correlated and therefore sample weights are used to determine the population point estimates. For these reasons, it is often recommended that weighted data be used and reported when working with NLTS-2 data. However, the current study does not seek to generalize to the population of special education students in its entirety. Additionally, some initial data analysis revealed that using weighted data increased the sample size to a point where almost all analyses were significant at the $p < .001$ level. For these reasons, the current study did not utilize weights when analyzing the data.

Data Preparation

To prepare for data analysis, one database of all relevant case and variables was needed. SPSS was used to merge 9 data files into one data file, using the student identification number to match cases. Participants were divided into two groups, using data about the diagnosis collected during the W1 Parent Interview. The ASD group included all students with a primary classification of ASD. The second group was comprised of students with all other diagnoses, including: Learning Disability, Speech Impairment, Intellectual Disability, Emotional Disturbance, Hearing Impairment, Visual Impairment, Orthopedic Impairment, Other Health Impairment, Traumatic Brain Injury, Multiple Disabilities, and Deaf/Blindness. Cases in which the primary disability category was blank were deleted. A total sample of 9,228 cases remained, where 922 students were in the ASD group and 8,306 students were in the other group.

Descriptive & Comparative Statistics

Descriptive statistical analysis was conducted to describe demographic backgrounds of the participants, including information about their age, year in school,

age when they first began to receive special education services, ethnicity, and parents' or guardian's household income. Additionally, information about the student's school (e.g., is inclusion available, age when transition planning begins) and the student's school program (e.g., does the child receive vocational instruction) were analyzed. Students with ASD and students with other disabilities in the sample were compared using t-test and chi-squared tests on these various demographic, school, and school program variables. Comparative statistics were used to explore the relationship between groups on various indicators of level of parent reported adaptive functioning, including communication, skills, social skills, and functional cognitive ability.

Predictive Statistics

Two multiple logistic regression analysis were computed to determine which of the transition variables explained the most variance on post school outcomes for students with ASD. The dependent variables were screened from outliers using z-scores, any cases falling more than 3.0 standard deviation from the mean was excluded from the analysis. All predictor variables were examined to determine if they significantly correlate with the dependent variable and show any intercorrelations. A combination of tolerance and VIF was used to determine the effect of multicollinearity on the regression equation, and predictors with VIF scores higher than 4.0 were not included in the analysis. To control for the potential reduction in the prescriptive power of the regression equation (shrinkage), the ratio of subjects-to-predictors in the main regression analysis was kept above 15:1. All variables of interest were entered into the analysis using the "Enter" command. Mahalanobis' and Cook's distance were used to check for outliers, when necessary outlier were be excluded from the analysis. Baron and Kenny (1986)

requirements were used to evaluate the effect of individual, family, and school characteristics on the predictive validity of the regression equation.

Chapter 4

RESULTS

This is a secondary data analysis based on the NLTS-2 that explores the relationship between school program variables, student and family factors, and postsecondary outcomes in education, employment, independent living, and community participation of students diagnosed with ASD.

Sample Characteristics

The sample for the NLTS-2 data used for the purposes of this analysis included 9,228 students who received special education services related to the disabilities listed in Table 4.1. Of these students, 922 (10%) are identified by the school as having ASD as their primary diagnosis at the time of W1 Data collection in 2001. See Table 4.1 for frequencies and percentages.

Table 4.1. Frequency and Percentages of Included Disability Categories

	Frequency	Percentage
Disability Category:		
Learning Disability	884	9.6%
Speech and Language Impairment (SLI)	871	9.4%
Intellectual Disability (ID)	865	9.4%
Emotional Disturbance (ED)	836	9.1%
Hearing Impairment	865	9.4%
Visual Impairment	686	7.4%
Orthopedic Impairment	913	9.9%
Other Health Impairment (OHI)	922	10.0%
Autism (ASD)	922	10.0%
Traumatic Brain Injury (TBI)	374	4.1%
Multiple Disabilities	923	10.0%
Deaf/Blindness	167	1.8%
TOTAL	9228	100%

Students with a secondary diagnosis represented 62.3% of the sample (N=5,753) and those with only one diagnosis represented 37.7% percent of the sample (N=1,637). The chi square (χ^2) statistic was calculated to determine whether or not there was a relationship between having a primary diagnosis of ASD and having a secondary diagnoses. Results indicate that the null hypothesis of no relationship between disability category and having a secondary diagnosis was rejected, $\chi^2 (1, 9,228) = 10.77, p = .001$. Overall, 57.4% (N=529) of students with ASD report having as secondary diagnosis and 62.9% (N=5,224) of students with other disabilities report having a secondary diagnosis. On a percentage basis, students with a primary diagnosis of ASD were overrepresented in the group of students without a secondary diagnosis. Specifically, of all 3,475 students without a secondary diagnosis, 11.3% (N=393) had a primary diagnosis of ASD. Frequencies and percentages are presented in Table 4.2. The chi square (χ^2) statistic was also calculated to evaluate the distribution of secondary diagnoses across groups. Again, analysis of the chi squared statistic reveals that the null hypothesis of no relationship between disability category and type of secondary diagnosis was rejected, $\chi^2 (7, 9,228) = 78.81, p = <.001$. The majority of students with ASD fall into the Not Applicable group (N=831, 92.5%). Additionally, 5.7% (N=51) of students with ASD have a secondary diagnosis of SLI, and of all students with a secondary diagnosis of SLI (N=178, 2.0%), 28.7% (N=51) of this group has a primary diagnosis of ASD. A similar pattern exists in students with a secondary diagnosis of OHI (N=31, 0.3%), where 16.1% (N=5) of this group has a primary diagnosis of ASD, ID (N=50, 0.6%), where 10.0% (N=5) of this group has a primary diagnosis of ASD, and ED (N=14, 0.2%), where 14.3% (N=2) of this group has a primary diagnosis of ASD.

Table 4.2 Frequencies and Column Percentages for Secondary Diagnosis

	ASD		Other	
	N	%	N	%
Youth Has a Secondary Diagnosis:				
No	393	42.6%	3082	37.1%
Yes	529	57.4%	5224	62.9%
Secondary Diagnosis:				
Not Applicable	831	92.5%	7754	95.3%
Learning Disability (LD)	4	0.4%	60	0.7%
Multiple Disabilities (MD)	0	0.0%	22	0.3%
Other Health Impairment (OHI)	5	0.6%	26	0.3%
Autism (ASD)	0	0.0%	1	0.0%
Traumatic Brain Injury (TBI)	0	0.0%	1	0.0%
Intellectual Disability (ID)	5	0.6%	45	0.6%
Speech Impairment (SLI)	51	5.7%	127	1.6%
Emotional Disturbance (ED)	2	0.2%	12	0.1%
Hearing Impairment	0	0.0%	6	0.1%
Developmental Delay	0	0.0%	1	0.0%
Visual Impairment	0	0.0%	8	0.1%
Orthopedic Impairment	0	0.0%	19	0.2%

Preliminary Analysis

Preliminary analyses were conducted to examine descriptive statistics and frequencies for each variable from the NLTS-2 data set that was considered for use in this analysis. Variables from the NLTS-2 database that best represented the constructs of interest and were reviewed and categorized in Chapter 3 were selected for inclusion in the present study. These variables were selected (1) to provide demographic information about the students, schools and families included in the sample, (2) were an indicator of best practices in transition planning, and (3) to provide postsecondary outcome information (e.g., job status, postsecondary education status, etc.). Frequencies of missing values for each variable of these variables and patterns of missing data were

evaluated for all variables. As shown in Table 4.3 in Appendix B, missing data for individual variables ranged from 0.0% to 62.6%. Variables with more than 10% of data missing were included in the analyses if missing data appeared to be evenly distributed (less than 5% difference) across groups.

Descriptive Data Analysis

Descriptive statistical analysis was conducted to characterize the participants and their families and school and educational program characteristics. Crosstabulation analysis was used to analyze the bivariate relationships between relevant variables for the sample. Crosstabulation analysis served a crucial role in identifying the underlying relationships within the study. Interval data were evaluated using independent samples t-tests. Student characteristics, family characteristics, school characteristics, program characteristics, and classroom characteristics are described in the section below.

School Characteristics

On average, students in the sample attended schools where 3.85 (SD=21.87) students in the school receive special education services are classified with ASD. An independent samples t-test was used to determine if students with ASD differed substantially from other students who receive special education services on this domain. Results indicate that the null hypothesis of no difference between the groups was rejected, $t(4,815) = -18.00, p < .001$. On average, when compared to students with other special education classifications (M = 2.05, SD=6.04), students with ASD (M=20.62, SD= 65.57) attended schools with more students who were classified with ASD. However, there was considerable variance within the ASD group. See Table 4.4 for further details.

Table 4.4. Number of School-Based Services Received by Students at School

	Frequency	Mean (SD)
Disability Category:		
Autism	466	20.62 (65.57)
Other	4351	2.05 (6.04)
Total	4817	3.85 (21.87)

Most students included in the sample attended schools in suburban (N=2501, 53.8%) and urban (N=1691, 36.4%) settings. This was also true of students with ASD. The chi square (χ^2) statistic was calculated to determine whether there was a relationship between Autism diagnosis and school urbanicity. Analysis of the results reveals that the null hypothesis of no relationship between the disability category and the type of school the child attended, $\chi^2(1, 4,649) = 32.30, p < .001$, was rejected. See Table 4.5 for further details.

Table 4.5 Urbanicity of School Student Attends

	ASD		Other	
	N	%	N	%
Urbanicity:				
Rural	20	4.3%	437	10.5%
Suburban	232	49.5%	2269	54.3%
Urban	217	46.3%	1474	35.3%

Most students included in the sample attend schools that provide individualized transition plans for students who receive special education services (N=3783, 96.9%). Out of all of these students, 9.0% have ASD. The majority of students with ASD

(N=352) and the majority of the group of students with other disabilities (N=3551) attended schools where individualized transition plans are created. The chi square (χ^2) statistic was calculated to determine whether there was a relationship between ASD diagnosis and school provision of an individual transition plan. Analysis of the results reveals that the null hypothesis of no relationship between the disability category and the type of school the child attended, $\chi^2(1, 3,903) = 0.15, p = .703$, was not rejected. See Table 4.6 for further details. Similarly, most students in the sample attend schools that provides instruction that focuses on transition planning from students with disabilities (N=3,145, 82.9%). Out of all of these students, 9.1% have ASD. The chi square (χ^2) statistic was calculated to determine whether or the distribution of students with ASD is the same as that of the total. Analysis of the results also reveals that the null hypothesis was not rejected, $\chi^2(1, 3,792) = 0.781, p = .377$. The majority of students with ASD (N=339) and the majority of the group of students with other disabilities (N=3455) attended schools where instruction that focuses on transition planning for students with disabilities is provided, and the distribution is consistent with the distribution of the total sample. See Table 4.6 for frequencies and column percentages.

Table 4.6 Frequencies and Column Percentages for Services Available at School

	Autism (ASD)	Other Disabilities
School Does Not Provides Individual Transition Plan for Students with Disabilities:		
No		
N	340	3443
Percent	96.6%	97.0%
Yes		
N	12	108
Percent	3.4%	3.0%

Total	352	3551
N	9.0%	91.0%
% of Total		
School Provides Instruction that focuses on Transition Planning for Students with disabilities:		
No		
N	52	595
Percent	15.3%	17.2%
Yes		
N	287	2858
Percent	84.7%	82.8%
Total		
N	339	3453
% of Total	8.9%	91.1%

On average, students in the sample attended schools where transition planning begins when the student is 14.57 years old (SD=6.14). An independent samples t-test was used to determine if students with ASD differed substantially from other students who receive special education services on this domain. Results indicate that the null hypothesis of no difference between the groups was not rejected, $t(3,894) = 0.02$, $p = .817$. On average students with ASD ($M=14.57$, $SD= 6.47$) and students with other disability classifications ($M=14.58$, $SD=6.11$) attend schools where individualized transition planning is at roughly the same time. See Table 4.7 for further details.

Table 4.7. Student age at the time the school begins to develop an individualized transition plan for students with disabilities.

	Frequency	Mean (SD)
Disability Category:		
Autism	385	14.57 (6.47)
Other	3511	14.58 (6.11)
Total	3896	14.57 (6.15)

Most students in the sample attended schools that provide college/career awareness support programming for students with disabilities (N=4,006, 82.9%), that have school-to-work activities and employment services (N=3,461, 71.65%) and where inclusion is available (N=3,879, 95.5%). This was also true of students with ASD. The chi square (χ^2) statistic was calculated to investigate whether there was a relationship between ASD diagnosis and access to inclusion. Results reveal that the null hypothesis of no relationship between disability category and inclusion, $\chi^2(1, 4,062) = 0.02, p = .893$, was not rejected. However, there was not an equal distribution of students in schools that have college/career awareness programming, school-to-work activities and employment services, or peer support programming. Chi squared statistics and p-values are presented in table 4.8. The majority of students with ASD attend schools with college/career awareness programming (71.3%) and school-to-work and employment services (66.1%) less frequently than students with other disabilities. In contrast, a greater number of students with ASD attended schools where peer support programming was available (46.6%) compared to students with other disabilities (39.8%). See Table 4.9 for frequencies and column percentages.

Table 4.8. Chi Squared Statistics for School Characteristics

Item	N	Pearson's Chi Value	P Value
School has college/career awareness programming	4831	48.46	<.001
School has school-to-work activities and employment services	4831	7.72	.005
School has Peer Support Program	4028	6.24	.012
Inclusion is available	4062	0.02	.893

Table 4.9 Frequencies and Column Percentages for School Characteristics

	Autism (ASD)	Other Disabilities
School has college/career awareness programing:		
No		
N	132	693
Percent	28.7%	15.9%
Yes		
N	328	3678
Percent	71.3%	84.1%
Total		
N	469	4371
Percent	9.5%	90.5%
School has school-to-work activities and Employment Services:		
No		
N	156	1214
Percent	33.9%	27.8%
Yes		
N	304	3157
Percent	66.1%	72.2%
Total		
N	460	4371
Percent	9.5%	90.5%
School has Peer Support Program:		
No		
N	194	2206
Percent	53.4%	60.2%
Yes		
N	169	1459
Percent	46.6%	39.8%
Total		
N	363	3665
Percent	9.0%	91.0%
Inclusion is available:		
No		
N	17	166
Percent	4.6%	4.5%

Yes		
N	349	3530
Percent	95.4%	95.5%
Total		
N	366	3639
Percent	9.0%	91.0%

Program Characteristics

The majority of students included in the sample receive special education services (N=8,202, 94.8%). This was also true of students with ASD, where 99.0% (N=867) of the sample reports that they receive special education services through an IEP. Out of the 8,208 students in the sample who have an IEP, 10.6% are classified with ASD. The chi square (χ^2) statistic was calculated to test the null hypothesis of no relationship between the disability diagnosis and whether or not the student has an IEP. Results indicate that the null hypothesis of no relationship between disability category and having an IEP was rejected, $\chi^2(2, 8,656) = 34.17, p = <.001$. See Table 4.10 for frequencies and percentages. Only, 0.8% of students included in the sample receive special education services through a 504 Plan (N=66). This was also true of students with ASD, where 0.3% of the sample reports that they receive special education services (N=3). On a percentage basis, students with ASD are overrepresented in the group of students without a 504 Plan. Specifically, of the 8579 students without a 504 Plan, 10.2% had a primary diagnosis of ASD. Here, analysis of the chi square (χ^2) statistic reveals the null hypothesis of no relationship between the disability diagnosis and having a 504 plan for special needs, $\chi^2(1, 8,648) = 2.55, p = .111$, was not rejected. The results reflect the fact that there is little variation in frequency of having an 504 plan between the groups. See Table 4.10 for frequencies and column percentages.

Table 4.10. Frequencies and Column Percentages for Students Eligibility for Special Education Services

	<u>ASD</u>		<u>Other</u>	
	N	%	N	%
Youth Receives Special Education Services/Has IEP:				
Yes	867	99.0%	7341	94.4%
No	8	0.9%	394	5.1%
Never was in Special Education	1	0.1%	45	0.6%
Youth has a 504 Plan for Special Education Needs:				
No	872	99.7%	7707	99.2%
Yes	3	0.3%	66	0.8%

In all, most parents (N=6,231, 72.9%) of the students sampled report that they learn about services for their child through the child's school. Similarly, 64.1% of parents with autistic children report learning about services through the child's school. However, parents of children with ASD were overrepresented in the group who reported that the school did not provide them with the information about services. Of those who do not report that they learn about available services from their child's school (N=2,319, 27.1%), 13.7% (N=317) are classified with ASD. The chi square (χ^2) statistic was calculated to investigate whether there was a relationship between ASD diagnosis and where the child's family learns about services. Analysis of the results reveals that the null hypothesis of no relationship between disability category and where the family learns about services was rejected, $\chi^2 (1, 8,550) = 38.69, p = <.001$. See Table 4.12 for frequencies and column percentages.

Given that families of students with a classification of ASD appear to learn about available services from their child's school at a lower rate than student with other disabilities, it is important to establish where these families are learning about services for their child. For this reason, the chi square (χ^2) statistic was also calculated to investigate whether or the distribution of students with ASD is similar to the total distribution with regards to other possible sources of information, including: professional consultants, other parents, family members, the computer/internet, newsletters/magazines, trainings/workshops, and public/private agencies. Results also indicate that the null hypothesis was rejected at the $p < .001$ level when comparing the families of students with ASD and families of students with other disabilities for those who learn about services from a professional consultant, other parents or parent groups, the computer/internet, newsletters/magazines, and trainings/workshops/conferences. Results also that the null hypothesis was rejected at the $p < .05$ for those who learn about services from public or private agencies. Chi squared statistics and p -values are presented in table 4.11. There was the most substantial difference between the families of students with ASD and the families of students with other disabilities for those who learned about services from parent groups. Specifically, 32.5% (N=287) of parents of children with ASD report learning about services from parent groups, while only 16.1% (N=1,234) parents of children with other disabilities report learning about services from other parents. There was also a substantial difference between the families of students with ASD and the families of students with other disabilities for those who learned about services from the web/internet, where parents of students with ASD report using this

resource more frequently (N=118, 20.1%) than families of students with other diagnoses (N=470, 6.1%). See Table 4.12 for frequencies and column percentages.

Table 4.11. Chi Squared Statistics for Where the Family Learns About Services

Item	N	Pearson's Chi Value	P Value
Family learns about services from school	8550	38.69	<.001
Family learns about services from a professional consultant	8550	17.33	<.001
Family learns about services from physician	8550	0.06	.811
Family learns about services from other parents/parent group	8550	146.31	<.001
Family learns about services from family members	8550	0.60	.439
Family learns about services from the computer/internet	8550	64.91	<.001
Family learns about services from newsletters/magazines	8550	44.46	<.001
Family learns about services from trainings/workshops/ conferences	8550	79.34	<.001
Family learns about services from public/private agencies	8550	5.87	.015

Table 4.12 Frequencies and Column Percentages for Where Family Learns About Services

	ASD		Other	
	N	%	N	%
Learns about Services from School:				
No	317	35.9%	2002	5666
Yes	565	64.1%	26.1%	73.9%
Learns about Services from Professional Consultant:				
No	709	80.4%	6568	85.6%
Yes	173	19.6%	1100	14.3%
Learns about Services from Physician:				
No	750	85.0%	6497	84.7%

Yes	132	15.0%	1171	15.3%
Learns about Services from Other Parent/ Parent Group:				
No	595	67.5%	6434	83.9%
Yes	287	32.5%	1234	16.1%
Learns about Services from Family Members:				
No	822	93.2%	7091	92.5%
Yes	60	6.8%	577	7.5%
Learns about Services from Web/Internet:				
No	764	86.6%	7198	93.9%
Yes	118	13.4%	470	6.1%
Learns about Services from Newsletters/Magazines:				
No	720	8.4%	6841	89.2%
Yes	162	18.4%	827	10.8%
Learns about Services from trainings/ workshops/ conferences:				
No	788	89.3%	7363	96.0%
Yes	94	10.7%	305	4.0%
Learns about Services from public/private agencies:				
No	840	95.2%	7422	96.8%
Yes	42	4.8%	246	3.2%

On average, students in the sample received 2.78 (SD=2.41) school-based services. An independent samples t-test was used to determine if students with ASD differed substantially from other students who receive special education services on this domain. Results indicate that the null hypothesis of no difference between groups was

rejected, $t(8,615) = -10.81, p < .001$. On average, students with ASD ($M=3.60, SD= 2.19$) received more school based services when compared to students with other special education classifications ($M = 2.68, SD=2.42$), but there was less variation. See Table 4.13 for further details.

Table 4.13. Number of school-based services received by the student

	Frequency	Mean (SD)
Disability Category:		
Autism	881	3.60 (2.18)
Other	7736	2.68 (2.42)
TOTAL	8617	2.78 (2.41)

Most students in the sample do not receive psychological, mental health, or counseling services ($N=6,682, 75.6\%$) or social work service ($N=7,313, 82.7\%$) through the school. This was also true of student with ASD. Specifically, only 28.5% ($N=254$) of student with ASD receive psychological, mental health, or counseling services and only 23.6% ($N=212$) receive social work services at school. However, on a percentage basis, students with ASD were overrepresented in both of these groups. Of all the student who received school based psychological or mental health services ($N=2,161$), 11.8% had a classification of ASD. Similarly, of all the students who received school based social work services ($N=1,526$), 13.9% had a classification of ASD. The chi square (χ^2) statistic was calculated to determine if there was a relationship between ASD diagnosis and parent reported participation in these services. Results indicate that the null hypothesis of no relationship between the disability category and parent reported participation in services, $\chi^2(1, 8,843) = 8.76, p = .003$, and receiving social work services, $\chi^2(1, 8,839) =$

27.96, $p < .001$, at school were both rejected. See Table 4.14 for frequencies and percentages.

Similarly, most students in the sample do not receive occupational therapy (N=6,289, 73.3%) or career counseling services (N=6862, 77.2%) through the school district. A larger percentage of students with ASD (N=392, 44.9%) report that they receive occupational therapy services from school when compared to students with other disabilities (N=1,901, 24.7%), and students with ASD make up 17.1% of all students who receive occupational therapy services in the sample (N=2,293). Analysis of the chi squared (χ^2) statistic indicates that the null hypothesis of no relationship between disability category and receipt of occupational therapy services through the school district was rejected, $\chi^2(1, 8,582) = 164.12, p < .001$. See Table 4.14 for frequencies and percentages. In contrast, students with ASD were more similar to student with other disabilities in the rates in which they received career counseling services from the school district. Overall, most students sampled (N=6,862, 79.6%) did not receive any career counseling services. Of those who did (N=1,759), 11.4% (N=201) had a classification of ASD. The chi square (χ^2) statistic was calculated to determine whether there was a relationship between ASD diagnosis and receipt of career counseling services. Results reveals that the null hypothesis of no relationship between the disability diagnosis and parent reported participation in career counseling services at school, $\chi^2(1, 8,621) = 3.37, p < .066$, was not rejected. Out of all student with ASD, 22.8% received career counseling and out of all student with other disabilities, 20.1% received career counseling. See Table 4.14 for frequencies and percentages.

At the time of wave 1 data collection in 2001, most students in the sample had not participated in volunteer or community service within the past 12 months (N=5,439, 61.0%). This was also true of students with ASD, where 67.4% of the sample (N=611) reported that they had not participated in volunteer or community services within the past 12 months. However, on a percentage basis, students with ASD were overrepresented in this group. Specifically, 11.2% of all students who reported that they did not participate in volunteer or community services within the past 12 months had a diagnosis of ASD. The chi square (χ^2) statistic was calculated to determine whether a relationship exists between ASD diagnosis and participation in volunteer community service. Results indicate the null hypothesis of no relationship between disability category and participation in volunteer community series was rejected, $\chi^2(1, 8,923) = 14.43 p < .001$. Students with ASD (N=296, 32.5%) were reported to participate in volunteer/community services less frequently than students with other disabilities (N=3,188, 39.8%). See Table 4.14 for frequencies and percentages.

Table 4.14 Frequencies and Column Percentages for Parent Reported Student Participation in School Related Services

	ASD		Other	
	N	%	N	%
Child Receives Psychological, Mental Health, or Counseling Services at School:				
No	638	71.5%	6044	76.0%
Yes	254	28.5%	1907	24.0%
Child Receives School Work Services Through School				
No	687	76.4%	6626	83.5%
Yes	212	23.6%	1314	16.5%

Child Receives Occupational/Life Skills Therapy Form School/District				
No	481	55.1%	5808	75.3%
Yes	392	44.9%	1901	24.7%
Child Receives Career Counseling from School/District				
No	682	77.2%	6180	79.9%
Yes	201	22.8%	1558	20.1%
Student has done volunteer/community service in the past 12 months:				
No	611	67.4%	4828	60.2%
Yes	296	32.6%	3188	39.8%

Most students in the sample do not have behavior management services (N=3,914, 84.4%) or self-advocacy training (N=4,046, 87.2%) as part of their IEP/504 Plan. A larger percentage of students with ASD (N=165, 33.8%) receive behavior management services when compared to students with other disabilities (N=561, 13.5%), and students with ASD make up 27.2% of all students who receive behavior management services in the sample (N=726). Analysis of the chi squared (χ^2) statistic indicates that the null hypothesis of no relationship between disability category and having behavior management services delivered through the IEP was rejected $\chi^2(1, 4,640) = 136.34, p < .001$. See Table 4.15 for frequencies and percentages. In contrast, students with ASD were more similar to student with other disabilities in the rates in which they received self-advocacy training. Overall, most students sampled did not receive any career self-advocacy training (n=4,046, 87.2%). Of those who did (N=594), 11.3% had a classification of ASD (N=67). The chi square (χ^2) statistic was calculated to there was a relationship between ASD diagnosis and having self-advocacy training included in the

IEP. Results reveals that the null hypothesis of no relationship between the disability diagnosis and participation in self-advocacy training at school, $\chi^2(1, 4,640) = 0.42, p = .517$, was not rejected. Out of all student with ASD, 13.7% received self-advocacy training and out of all student with other disabilities, 12.7% received self-advocacy training. See Table 4.15 for frequencies and percentages.

At the time of wave 1 data collection in 2001, most students in the sample began to receive services geared towards their transition to adult life (N=3,762, 87.4%) and had receive instruction specifically focused on transition planning (N=2,193, 63.5%) This was also true of students with ASD, where 85.1% (N=387) of the sample of students with ASD began the transition planning processes and 67.4% (N=244) had received instruction specifically focused on transition planning. Similarly, 87.7% (N=3,375) of students with other disabilities began to receive transition planning services by the time of W1 data collection in 2001 and 63.1% (N=1,949) had received instruction specifically focused on transition planning. The chi square (χ^2) statistic was calculated to investigate if groups were represented equally across these domains. Results reveal that the null hypothesis of no relationship between the disability diagnosis and whether or not transition planning had started, $\chi^2(1, 4,305) = 2.51, p = .113$, or whether or not the student received instruction specifically focused on transition planning, $\chi^2(1, 3,453) = 2.65, p = .104$, were both not rejected. See Table 4.15 for frequencies and percentages.

For students with a transition plan, most students in the sample have a transition plan that specifies the course of study needed to achieve their individualized postsecondary goals (N=2,631, 71.2%). This was also true of students with ASD, where 64.7% of the sample (N=246) have a transition plan that specifies the course of study

needed to achieve their postsecondary goals. The chi square (χ^2) statistic was calculated to determine if there was a relationship between ASD diagnosis and having a transition plan that specifies the course of study needed to achieve postsecondary goals. Results indicate that the null hypothesis of no relationship between disability category and having a transition plan that specifies the course of study needed to achieve postsecondary goals was rejected, $\chi^2(1, 3,697) = 8.53$ $p = .003$. Students with ASD (N=246, 64.7%) were reported to have a specified course of study to help them achieve their transition goals less frequently than students with other disabilities (N=2,358, 71.9%). Additionally, on a percentage basis, students with ASD were overrepresented in the group of students without a specific course of study outlined in their IEP. Specifically, 12.6% (N=134) of all students who reported that they did not have a specific course of study to achieve transition goals were classified with ASD. See Table 4.15 for frequencies and percentages.

The transition plans of most students in the sample were rated as either fairly well suited (N=1,556, 41.9%) or very well suited (N= 1511, 40.7%). This was also true of students with ASD. Specifically, 37.7% (N=143) of the students with a classification of ASD were reported to have a transition plan that was fairly well suited at preparing them for their transition planning goals and 41.7% (N=158) of these plans were described to be very well suited. The chi square (χ^2) statistic was calculated to determine whether or not there was a relationship between disability category and how well the student's transition plan was rated. Results reveal that the null hypothesis of no relationship between ASD diagnosis and how well suited the student's transition plan was rated, $\chi^2(1, 3,711) = 5.30$, $p = .151$, was not rejected. See Table 4.15 for frequencies and percentages.

Table 4.15 Frequencies and Column Percentages for School Reported Student

Participation in School Services

	<u>ASD</u>		<u>Other</u>	
	N	%	N	%
Child has behavior management programming as part of their IEP/504 Plan:				
No	323	66.2%	3591	86.5%
Yes	165	33.8%	561	13.5%
Child has self-advocacy training as part of their IEP/504 Plan:				
No	421	86.3%	3625	87.3%
Yes	67	13.7%	527	12.7%
There has been planning for this student's transition to adult life:				
No	68	14.9%	475	12.3%
Yes	387	85.1%	3375	87.7%
Student with transition plan received instruction specifically focused on transition planning:				
No	118	32.6%	1142	36.9%
Yes	244	67.4%	1949	63.1%
Transition plan specifies course of study to achieve post school goals:				
No	134	35.3%	932	28.1%
Yes	246	64.7%	2385	71.9%
Suitability of program for preparing student for transition goals:				
Not very well suited	6	1.6%	62	1.9%
Somewhat well suited	72	19.0%	504	15.1%
Fairly well suited	143	37.7%	1413	42.4%
Very well suited	158	41.7%	1353	40.6%

On average, students in the sample began to receive transition planning services when they were 14.37 years old (SD=0.97). An independent samples t-test was used to determine if students with ASD differed substantially from other students who receive

special education services on this domain. Results indicate that the null hypothesis of no difference between groups was not rejected, $t(3,632) = 0.10, p = .234$. On average, students with ASD ($M=14.36, SD= 0.97$) began transition planning at around the same age as children with other special education classifications ($M = 14.37, SD=0.96$). See Table 4.16 for further details.

Table 4.16. Age of Student when Transition Planning Began

	Frequency	Mean (SD)
Disability Category:		
Autism	373	14.36 (0.97)
Other	3261	14.37 (0.96)
TOTAL	3634	14.37 (0.97)

Most students in the sample were described as taking an active role and providing some input in his or her transition plan ($N=1,860, 51.7\%$). The chi square (χ^2) statistic was calculated to determine whether there was a relationship between ASD diagnosis and participation in transition planning. Results indicate that the null hypothesis of no relationship was rejected, $\chi^2 (1, 3,598) = 209.46 p < .001$. Most students with ASD were described as passively present in the transition planning process ($N=172, 16.8\%$). Additionally, on a percentage basis, students with ASD were overrepresented in the group of students who did not attend their transition planning meeting. Specifically, 26.4% ($N=87$) of all students who reported that they did not participate in the transition plan were classified with ASD. Similarly, on a percentage basis, students with ASD were underrepresented in the group of students who took a leadership role in their transition plan. Only 2.6% ($N=10$) of all students who were reported to have taken a leadership

role in their transition plan were classified with ASD. See Table 4.17 for frequencies and percentages.

Table 4.17 Frequencies and Column Percentages for School Reported Student Participation in Transition Planning

	ASD		Other	
	N	%	N	%
Student's role in his or her transition planning:				
Did not attend	87	23.5%	243	7.5%
Was present	172	46.4%	854	26.5%
Provided some input	102	27.5%	1758	54.5%
Took a leadership role.	10	2.7%	372	11.5%

Classroom Characteristics

On average, students in the sample were in classes with 13.69 students (SD=9.12). An independent samples t-test was used to determine if students with ASD differed substantially from other students who receive special education services on this domain. Results indicate that the null hypothesis of no difference between groups was rejected, $t(4,722) = 20.52, p < .001$. On average, students with ASD ($M=11.75, SD=8.26$) were in smaller classes than students with other special education classifications ($M = 13.91, SD=9.19$). See Table 4.18 for further details.

Overall, students in the sample scored an average of 11.35 (SD=2.90) on the Classroom Behavior Scale completed by the general education classroom teacher. This scale reflects the frequency that the student completes homework on time, takes part in group discussions, stays focused on work, and does not withdrawal from activities. Higher scores indicate that the student displays a higher frequency of behaviors that will help them succeed in the classroom. An independent samples t-test was used to compare

the scores achieved on the Classroom Behavior Scale by students with ASD to students with other disabilities. Results indicate that students the null hypothesis of no difference between groups was rejected, $t(4,576) = 8.35, p < .001$. On average, students with ASD ($M=10.26, SD=3.06$) scored lower than students with other disabilities ($M = 11.47, SD=2.88$). See Table 4.18 for further details.

Table 4.18. Classroom Characteristics

Class Size		
	Frequency	Mean (SD)
Disability Category:		
Autism	485	11.75 (8.26)
Other	4293	13.91 (9.19)
TOTAL	4724	13.69 (9.13)
Classroom Behavior Scale		
	Frequency	Mean (SD)
Disability Category:		
Autism	443	10.26 (3.06)
Other	4135	11.47 (2.88)
TOTAL	4578	11.35 (2.90)

Most students in the sample were reported to get along with other students very well ($N=4,037, 46.6\%$) and were also reported to get along with their teachers very well ($N=4,757, 54.7\%$). The chi square (χ^2) statistic was calculated to compare the distribution of students with ASD to the distribution of the total sample on these domains. Analysis of the Chi Squared (χ^2) statistic reveals that the null hypothesis of no relationship between disability category and relationship with peers, $\chi^2(1, 8,668) = 140.93, p < .001$, and teachers, $\chi^2(1, 8,691) = 28.91, p < .001$, were both rejected. Most students with ASD were reported to get along pretty well with their peers ($N=364, 41.9\%$) while the majority of students with other disabilities were reported to get along

with other students very well (N=3,723, 47.7%). While both groups of students were most frequently reported to get along very well with their teachers, students with ASD were rated very well (N=526, 60.3%) more often than students with other disability (N=4,231, 54.1%). See Table 4.19 for frequencies and percentages.

Overall, general education teachers were most likely to rate the work of the majority of students in the sample as average (N=3,261, 38.3%) or above average (N=2,450, 29.2%). Again, the chi square (χ^2) statistic was calculated to test the null hypothesis of no relationship between disability category and level of work, and analysis of the results reveals that the null hypothesis was rejected, $\chi^2(1, 8.403) = 77.96, p < .001$. Most students with ASD were reported to receive above average grades (N=315, 37.5%) and average grades (N=293, 34.9%) while the majority of students with other disabilities were reported to receive average grades (N=2,923, 38.6%) and above average grades (N=2,135, 28.2%). Overall, on a percentages basis students with ASD are reported to be higher achieving than their peers with other disabilities. See Table 4.19 for frequencies and percentages

Table 4.19 Frequencies and Column Percentages for Classroom Behaviors

	ASD		Other	
	N	%	N	%
How well youth gets along with students at secondary school:				
Very Well	314	36.1%	3723	47.7%
Pretty Well	364	41.9%	2869	36.8%
Not Very Well	104	12.0%	741	9.5%
Not Well at All	22	2.5%	202	2.6%
Mixed, Some Well, Some Not	23	2.6%	203	2.6%
Does Not Interact with Other Children	42	4.8%	61	0.8%

How well youth gets along with teachers at secondary school:				
Very Well	526	60.3%	4231	54.1%
Pretty Well	258	29.6%	2520	32.2%
Not Very Well	46	5.3%	608	7.8%
Not Well at All	10	1.1%	145	1.9%
Mixed, Some Well, Some Not	28	0.3%	310	4.0%
Does Not Interact with Other Teachers	4	0.5%	5	0.1%
Overall level of work at school:				
Excellent	108	12.9%	619	8.2%
Above Average	315	37.5%	2135	28.2%
Average	293	34.9%	2923	38.6%
Below Average	90	1.1%	1345	17.8%
Failing	33	3.9%	542	7.2%

Family Characteristics

On average, study participants live in homes with 4.27 (SD=1.51) other family members (N=8636), including 1.37 (SD=1.34) children (N=8,643) and 1.96 (SD=0.77) adults (N=8,637). An independent samples t-test was used to determine if the families of students with ASD differed substantially from the families of children with other disabilities on these domains. Results indicate that the null hypothesis of no difference between disability classification and the number of people living in the home, $t(8,634) = 3.76, p < .001$, and in the number of children living in the home, $t(8,641) = 4.44, p < .001$, were both rejected. On average, students with ASD (M=4.09, SD= 1.23) live in homes with fewer family members when compared to students who other special education classifications (M = 4.29, SD=1.53). Similarly, on average students with ASD (M=1.18, SD= 1.13) live in homes with fewer children when compared to students who other special education classifications (M = 1.39, SD=1.36). Analysis of the t-test results reveals that the null hypothesis of no difference between ASD diagnosis and the number

of adults living in the home, $t(8,635) = -0.30$, $p = .761$, was not rejected. Means, standard deviations, and probability values are provided in table 4.20.

Table 4.20 Mean Number of People Living in the Home

Number of People Who Live in the Home		
	Frequency	Mean (SD)
Disability Category:		
Autism	880	4.09 (1.30)
Other	7756	4.29 (1.53)
TOTAL	8363	4.27 (1.51)
Number of Children		
	Frequency	Mean (SD)
Disability Category:		
Autism	883	1.18 (1.13)
Other	7760	1.39 (1.36)
TOTAL	8643	1.37 (1.33)
Number of Adults		
	Frequency	Mean (SD)
Disability Category:		
Autism	881	1.97 (0.69)
Other	7756	1.96 (0.78)
TOTAL	8637	1.96 (0.77)

Most students in the sample live in a home with two parents (N=5,270, 62.5%).

This was also true of students with ASD, where 65.0% (N=567) of the sample reported living in a two-parent home, and students with other disabilities (N=4703, 62.2%). The chi square (χ^2) statistic was calculated to determine whether there was a relationship between ASD diagnosis and whether or not the child lives in a two-parent home.

Analysis of these results indicates that the null hypothesis of no relationship was rejected, $\chi^2 (6, 8,428) = 14.92$, $p = .021$. On a percentage basis, families of children with ASD were overrepresented in the group of students who report living in a two-parent home, in the group of students living in a one parent household, and in institutional settings. More

specifically, of all the students who reported living in two parent households (N=5270), 10.8% (N=567) have a diagnosis of ASD. Of all those living in one parent homes (N=2469), 10.5% (N=260) have a diagnosis of ASD. Of all those living in institutional settings (N=22), 13.6% (N=3) have a diagnosis of ASD. See Table 4.21 for frequencies and percentages.

Table 4.21 Frequencies and Column Percentages for Living Arrangements

	ASD		Other	
	N	%	N	%
Living Arrangements:				
Two Parents	567	65.0%	4730	62.2%
One Parent	260	29.8%	2209	29.2%
With Relatives	22	2.5%	389	5.1%
With Legal Guardian	9	1.0%	115	1.5%
In Foster Care	10	1.1%	96	1.3%
Institution	3	0.3%	19	0.3%
Other	1	0.1%	25	0.3%

Most students in the sample report living with parents who were, at some point, married (N=7,738, 92.4%), where English is the primary language spoken in the home (N=7,343, 81.9%). This was also true of students with ASD, where 92.6% report that their parents have married (N=804), and 84.6% only speak English in their home (N=760). Analysis using the chi square (χ^2) statistic reveals the null hypothesis of no relationship between the disability diagnosis and whether or not the child lives with parents who ever married, $\chi^2 (1, 8,374) = 0.07, p = .795$, was not rejected. In contrast, analysis of the chi square (χ^2) statistic reveals that the null hypothesis of no difference between disability diagnosis and whether or not the family speaks a language other than English in their home was rejected, $\chi^2 (1, 8,970) = 5.16, p = .023$. Here, while rates look

similar across groups, on a percentage basis students with ASD are overrepresented in the group of students who do not speak a language other than English in their home.

Specifically, of the 1,627 students who speak a language other than English in their home, 8.5% (N=138) are classified with ASD. See Table 4.22 for frequencies and percentages.

The majority of students included in the sample live in homes where no other children (N=6,578, 76.2%) or adults (N=7,003, 81.0%) living in the home are identified as having a disability or special needs. This was also true of students with ASD where 80.6% (N=712) of the sample reports that there are no other children in the home with a disability and 85.0% (N=750) live in homes where no adults are identified as having a disability or special needs (n=750). Analysis of the chi square (χ^2) statistic reveal that the null hypothesis of no relationship between diagnosis and participants who live in homes where another child also has a disability, $\chi^2(1, 8,631) = 10.60, p = .001$, or in homes with an adult who is also disabled, $\chi^2(1, 1,646) = 10.44, p = .001$, were both rejected. On a percentage basis, students with ASD are reported to live in homes without another child or another adult who is disabled more frequently than students with other disabilities. See Table 4.22 for frequencies and percentages.

Table 4.22 Frequencies and Column Percentages for Household Characteristics

	ASD		Other	
	N	%	N	%
Lives with Parents Who Never Married:				
No	840	92.6%	6934	92.4%
Yes	64	7.4%	572	7.6%
Language Other Than English Spoken in Home:				
No	760	84.6%	6583	81.6%
Yes	138	15.4%	1489	18.4%

Yes				
Adult with Disability Living in Home:				
No	750	85.0%	6253	80.5%
Yes	132	15.0%	1512	19.5%
Other Children with Disability Living in Home:				
No	712	80.6%	5866	75.7%
Yes	171	19.4%	1882	24.3%

At the time of wave 1 data collection in 2001, on a percentage basis, students included in the sample were evenly distributed across income categories. Specifically, 35.1% (N=2,926) of participants reported an annual income of under \$25,000, 30.3% (N=2526) of participants reported an annual income of \$25,001 - \$50,000, and 34.6% (N=2897) of participants report an annual income over \$50,000. In contrast, the majority of students with ASD live in homes where the reported annual income is over \$50,000 (44.9%), while only 33.4% (N=2,505) of students with other disabilities report earnings within this range. Additionally, on a percentage basis student with ASD were overrepresented in this group. Specifically, of the 2,879 participants who live in homes where the annual income is greater than \$50,000, 13.0% (N=374) have a primary diagnosis of ASD. The chi squared statistic (χ^2) was used to determine whether or not there was a relationship between ASD diagnosis and income and results indicate that the null hypothesis of no relationship is rejected, $\chi^2 (2, 8,331) = 47.15, p = <.001$. The chi square (χ^2) statistic was also calculated to evaluate the distribution of families who receive SSI across diagnostic categories. Overall, at the time of Wave 1 data collection, most students in the sample had not received SSI within the past two years (N=6415,

74.4%). This was also true of students with ASD (N=592, 67.5%). However, on a percentage basis students with ASD (N=285, 32.5%) reported having received SSI within the past two years more frequently than families of children with other disabilities (N=1,918, 24.8%). Additionally, of all 2203 families who reported having received SSI within the past 2 years, 12.9% (N=285) of this group has a diagnosis of ASD. Analysis of the chi square (χ^2) statistic reveals that the null hypothesis of no relationship between ASD diagnosis and receiving SSI was rejected, $\chi^2(1, 8618) = 24.67, p = <.001$. See Table 4.23 for frequencies and percentages.

Table 4.23 Frequencies and Column Percentages for Income and SSI

	ASD		Other	
	N	%	N	%
Income:				
\$25,000 and Under	226	27.1%	2700	36.0%
\$25,001 - \$50,000	233	28.0%	2293	30.6%
Over \$50,000	374	44.9%	2505	33.4%
Household received SSI in the past 2 years:				
No	592	67.5%	5823	75.2%
Yes	285	32.5%	1918	24.8%

Most heads of the households of students included in the sample report having received a high school diploma/GED (N=3,003, 35.5%). On a percentage basis, heads of the household of students in the sample identified as having ASD report achieving higher levels of education, where most report having obtained at least a Bachelor's degree (N=337, 38.3%). Additionally, on a percentage basis, students with ASD appear to be overrepresented in this group. Specifically, of the 1,796 families in the sample who report that the head of their household has achieved a B.A. or higher, 18.8% (N=337) have a child with a primary diagnosis of ASD. A similar pattern emerges for of children

in families where the head of the household has some college experience. Here, 26.9% (N=237) families of students with ASD fall into this category, and of the 2112 families who report that the head of the household completed some college, 11.2% (N=237) have a child with ASD. The chi squared (χ^2) statistic was calculated to determine whether or not there was a relationship between diagnosis and education level. Analysis of the chi square (χ^2) statistic reveals that the null hypothesis of no relationship was rejected, $\chi^2(3, 8,460) = 206.24, p = <.001$. See Table 4.23 for frequencies and percentages.

Table 4.23. Frequencies and Column Percentages for Head of Household Education

Level

	ASD		Other	
	N	%	N	%
Head of Household Education Level:				
Less than High School	83	9.4%	1466	19.3%
High School Grad or GED	224	25.4%	2779	36.7%
Some College	237	26.9%	1875	24.7%
B.A. or Higher Degree	337	38.3%	1459	19.3%

Student Characteristics

Men represented 64.8% of the sample (N=5,977) and women represented 35.2% percent of the sample (N=3,251). The chi square (χ^2) statistic was calculated to determine whether there was a relationship between ASD diagnosis and gender. Results indicate that the null hypothesis of no relationship between disability category and gender was rejected, $\chi^2(1, 9,228) = 166.98, p = <.001$. In the current sample, there is a higher frequency of males with ASD (N=775, 84.1%) than males with other disabilities (N=5,202, 62.6%). Additionally, of all 5,977 men in the sample, 13.0% (N=775) are

classified with ASD. Similarly, the chi square (χ^2) statistic was also used to evaluate whether there was a relationship between ASD diagnosis and ethnicity and indicates that the null hypothesis was rejected, $\chi^2(6, 9,227) = 62.67, p = <.001$. Overall, students included in this study came from racially diverse backgrounds, however the majority of students in the sample identify as White (N=5,771, 62.5%). On a percentage basis, students with ASD were overrepresented in the group of African American students. Specifically, of the 1,907 students who identify as African American, 9.3% (N=13.6%) are classified with ASD. Similarly, the chi square (χ^2) statistic the null hypothesis of no relationship between disability category and being of Hispanic or Latino origin was also rejected, $\chi^2(1, 9,200) = 17.65, p = <.001$. Students who identify as non-Hispanic or Latino made up the majority of both groups. On a percentage basis, students with ASD were overrepresented in the group of Non-Hispanic participants. Of the 7,692 students who do not identify as Hispanic or Latino, 10.6% (N=806) have a diagnosis of ASD. Additionally, a smaller percentage of students with ASD report that they identify as Hispanic or Latino (N=114, 12.4%) when compared to the frequency of students who identify as Hispanic or Latino and have other disabilities (N=1484, 17.9%). The sample of students with ASD is largely male (84.1%), Caucasian (58.1%), non-Hispanic or Latino (87.6%) which is consistent with what is known about the population of youth with ASD in the United States (Baio, et al., 2018). Frequencies and percentages are presented in Table 4.24.

The median age of the sample at the time of wave 1 data collection was 15.14 years old (SD = 1.21). The sample's age range was between 13-17 years. Most students in the sample were 14 years old (N=2,348, 25.5%), 15 years old (N=2,290, 24.8%), or 16

years old (N=2,305, 25.0%) at the time that wave 1 data were collected in 2001. This was also true of students with ASD, however on a percentage basis students with ASD are overrepresented in the group of 13-year-old participants. Specifically, of the 811 students who were 13 years old at the time of W1 data collection, 10.4% (N=84) have a diagnosis of ASD. Similarly, students with ASD were overrepresented in the group of 14-year-old participants, where 11.4% of all 14-year old students in the sample (N=2,348) have a diagnosis of ASD, and in the group of 15-year-old participants, where of the 2,290 15-year-old students in the sample (24.8%), 10.6% (N=243) are classified with ASD. The chi square (χ^2) statistic was used to evaluate whether there was a relationship between ASD diagnosis and age and results indicates that the null hypothesis of no relationship was rejected, $\chi^2(5, 9,223) = 18.08, p = .001$. Frequencies and percentages are presented in Table 4.24.

Table 4.24 Frequencies and Column Percentages for Gender & Ethnicity

	ASD		Other	
	N	%	N	%
Gender:				
Male	775	84.1%	5202	62.6%
Female	147	15.9%	3104	37.4%
Ethnicity:				
White	536	58.1%	5235	63.0%
African American	259	28.1%	1648	19.8%
Hispanic	83	9.0%	1153	13.9%
Asian/Pacific Islander	35	3.8%	156	1.9%
American Indian/ Alaska Native	4	0.4%	78	0.9%
Multi/Other	5	0.5%	35	0.4%
Youth is of Hispanic/Latino Origin:				
No	806	87.6%	6796	82.1%
Yes	114	12.4%	1484	17.9%

Age Group at time of W1 Data Collection (2001)				
	84	9.1%	727	8.8%
13	267	29.0%	2081	25.1%
14	243	26.4%	2047	24.7%
15	219	23.8%	2086	25.1%
16	108	11.7%	1361	16.4%
17				

On average, students included in the sample were reported 5.24 years-old when they began to receive services related to their diagnosis (N=8,497). An independent samples t-test was used to determine if students with ASD were significantly younger or older than other students who receive special education services at the time of their initial diagnosis. Results indicate that the null hypothesis of no difference between groups was rejected, $t(8,495) = 10.94, p < .001$. On average, students with ASD (M=3.89, SD= 2.41) were significantly younger than other students when they first received their diagnosis (M = 5.40, SD=3.99). Means, standard deviations, and frequencies are provided in table 4.25.

Table 4.25 Age of Youth at the Time of Service Onset

Age of student when they started to receive services related to their diagnosis.		
	Frequency	Mean (SD)
Disability Category:		
Autism	874	3.89 (2.41)
Other	7623	5.40 (3.99)
TOTAL	8497	5.24 (3.88)

Most of the sample reported not having repeated a grade (N=5,843, 67.3%). Similarly, most students with ASD report not having been held back a grade (N=680, 78.5%). The chi square (χ^2) statistic was calculated to evaluate the distribution of retention rates across disability categories, and results reveal that the null hypothesis of

no relationship between disability category and retention was rejected, $\chi^2 (1, 8,688) = 55.46, p = <.001$. While most students with other disabilities also have never been held back a grade (N=5,163, 66.0%), a higher percentage of students with other disabilities have repeated a grade (N=2,659, 34.0%) when compared to the percentage of students with ASD who report that they were held back (N=186, 21.5%). See Table 4.26.

Similarly, most students in the sample reported not having any paid job experience at the time of Wave 1 data collection (N=7,358, 85.5%). This was also true of most students with ASD (N=834, 95.6%). The chi square (χ^2) statistic was calculated to determine whether or not there was a relationship between ASD diagnosis and having paid job experience, and results reveal that the null hypothesis was rejected, $\chi^2 (1, 8,687) = 80.76, p = <.001$. When compared to students with other disabilities (N=1208, 15.6%), fewer students with ASD (N=39, 4.5%) reported having paid job experience at the time of W1 data collection. Additionally, on a percentage basis, students with ASD were overrepresented in the sample of students without a paying job at the time of Wave 1 data collection. Specifically, of the 7,358 participants without a job, 11.4% (N=834) were classified with ASD. See Table 4.26 for frequencies and column percentages.

Table 4.26 Frequencies and Column Percentages for Retention and Job Experience at time of Wave 1 Data Collection

	ASD		Other	
	N	%	N	%
Youth ever held back a grade:				
No	680	78.5%	5163	66.0%
Yes	186	21.5%	2659	34.0%
Paid Job Experience at time of W1 Data Collection				
No	834	95.5%	6524	84.4%

Yes	39	4.5%	1208	15.6%
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At the time of Wave 1 data collection, most students were reported by their parents to find school challenging and to enjoy school. Most parents also reported that they feel school is good at meeting their child's individual needs and that their child receives the needed support and services from their school. The chi square (χ^2) statistic was calculated to compare the distribution of students with ASD to the distribution of the total sample across several indicators of the youth's experience in his or her secondary school. Chi squared statistics are presented in table 4.27. Results indicate that the null hypothesis of no relationship between ASD diagnosis and level of functioning across all of these domains was rejected, with p -values that vary from $<.001$ to $.012$. Overall, more parents of students with ASD reported that they disagreed ($N=146$, 16.8%) or strongly disagreed ($N=30$, 3.5%) that school was challenging for their child. Additionally, on a percentage basis, students with ASD were overrepresented in these groups. Specifically, of the 1,173 parents who disagreed, 12.4% ($N=146$) have a child classified with ASD and of the 232 parents who strongly disagreed, 12.9% ($N=30$) have a child classified with ASD. With regards to enjoyment of school, on a percentage basis parents of children with ASD ($N=308$, 35.3%) more frequently indicated that they strongly agreed than parents of children with other disabilities ($N=2260$, 28.9%). Similarly, when compared to parents of children with other disabilities ($N=3,625$, 47.0%), parents of children with ASD ($N=482$, 55.8%) were more likely to indicate that they strongly agreed an adult in school knows and cares about their child. When asked about whether or not the school is good at meeting the youths individual needs, on a percentage basis parents of children with ASD ($N=68$, 7.8%) were more likely to indicate that they strongly disagreed than

the parents of children with other disabilities (N=381, 4.9%), and of all 449 (5.2%) parents who strongly disagreed 15.1% (N=68) have a child with ASD. A similar pattern emerges when youth were asked if they felt they were getting the supports/services needed from school. On a percentage basis, parents of children with ASD (N=405, 46.7%) were less likely than parents of children with other disabilities (N=3988, 51.1%) to agree. Additionally, out of all 1302 (15.0%) parents who disagree that their child is getting the needed supports/services from school, 11.2% (N=146) are parents of children with ASD, and of all the parents who strongly disagree (N=422, 4.9%) 13.5% (N=57) are parents of a child with ASD. Frequencies and percentages are presented in table 4.28.

Table 4.27. Chi Squared Statistics Parent Reported Student Enjoyment and Challenges

Item	N	Pearson's Chi Value	P Value
School is Challenging for Youth	8648	12.18	.007
Youth Enjoys School	8702	29.65	<.001
An Adult in School Knows/Cares about youth	8576	25.43	<.001
School is Good at Meeting the Individual Needs of the Youth	8669	15.20	.002
Youth is getting needed supports/services from School	8677	10.92	.012

Table 4.28 Frequencies and Column Percentages for Student Characteristics Related to Outcome Variables

	<u>ASD</u>		<u>Other</u>		<u>Total</u>	
	N	%	N	%	N	%
School is Challenging for Youth:						
Strongly Agree	235	27.1%	2325	29.9%	2560	29.6%
Agree	457	52.6%	4226	54.3%	4683	54.2%
Disagree	146	16.8%	1027	13.2%	1173	13.6%
Strongly Disagree	30	3.5%	202	2.6%	232	2.7%

Youth Enjoys School:						
Strongly Agree	308	35.3%	2260	28.9%	2568	29.5%
Agree	443	50.7%	3935	50.3%	4378	50.3%
Disagree	86	9.9%	1184	15.1%	1270	14.6%
Strongly Disagree	36	4.1%	450	5.7%	486	5.6%
An Adult in School Knows/Cares About Youth:						
Strongly Agree	482	55.8%	3625	47.0%	4107	47.9%
Agree	336	38.9%	3497	45.3%	3833	44.7%
Disagree	37	4.3%	472	6.1%	509	5.9%
Strongly Disagree	9	1.0%	118	1.5%	127	1.5%
School is Good at Meeting Youth's Individual Needs:						
Strongly Agree	267	30.8%	2360	30.3%	2627	30.3%
Agree	407	46.9%	3937	50.5%	4344	50.1%
Disagree	126	14.5%	1123	14.4%	1249	14.4%
Strongly Disagree	68	7.8%	381	4.9%	449	5.2%
Youth is Getting Needed Supports/Services from School:						
Strongly Agree	259	29.9%	2301	29.5%	2560	29.5%
Agree	405	46.7%	3988	51.1%	4394	50.6%
Disagree	146	16.8%	1156	14.8%	1302	15.0%
Strongly Disagree	57	6.6%	365	4.7%	422	4.9%

Comparative statistics were used to explore the relationship between groups on various indicators of level of functioning, including self-care skills, social skills, and functional cognitive ability at the time of Wave 1 data collection. Overall, students included in the sample scored 7.40 (SD=1.39) on the Self Care Skills Scale (N=9,124) at the time of Wave 1 data collection. It is possible to achieve scores ranging from 2 to 8 on the Self-Care Skills Scale. Scores ranging from 2-4 indicate low ability. Scores ranging

from 5-7 indicate medium ability. A score of 8 is indicative of high ability. An independent samples t-test was used to determine if students with ASD differed from other students who receive special education services on this domain. Results indicate that the null hypothesis of no difference between groups was rejected, $t(9,122) = 7.41, p < .001$. On average, students with ASD ($M=7.07, SD= 1.28$) scored lower on the self-care skills scale when compared to students who other special education classifications ($M = 7.43, SD=1.40$). Means, standard deviations, and frequencies are provided in table 4.29.

Overall, students included in the sample scored 12.51 ($SD=3.58$) on the Mental Skills Scale ($N=8,936$) at the time of Wave 1 data collection. Scores on the Mental Skills Scale can range from 4 to 16. Scores ranging from 4-8 indicate low mental ability. Scores between 9 and 14 indicate medium ability. Scores of 15 and 16 are indicative of high ability. An independent samples t-test was used to determine if students with ASD were different from other students who receive special education services on this domain. Results indicate that the null hypothesis of no difference between groups was rejected, $t(8,934) = 17.28, p < .001$. On average, students with ASD ($M=10.59, SD= 3.92$) scored lower on the Mental Skills Scale when compared to students with other special education classifications ($M = 12.73, SD=3.47$). Means, standard deviations, and frequencies are provided in Table 4.29.

Overall, students included in the sample scored 9.81 ($SD=3.03$) on the Household Responsibilities Scale ($N=8,966$) at the time of Wave 1 data collection. Students can achieve scores ranging from 4 to 16 on the Household Responsibilities Scale. A score of 4 to a score of 8 indicates low ability. Scores between 9 and 14 suggest medium ability. Scores of 15 and 16 suggest that the student possesses high ability. An independent

samples t-test was used to determine if students with ASD were different from other students who receive special education services on this domain. Results indicate that the null hypothesis of no difference between groups was rejected, $t(8,964) = 11.57, p < .001$. On average, students with ASD ($M=8.09, SD= 2.82$) scored lower on the Household Responsibilities Scale when compared to students with other special education classifications ($M = 9.30, SD=3.02$). Means, standard deviations, and frequencies are provided in table 4.29.

Overall, students included in the sample scored 13.49 ($SD=3.92$) on the Social Skills Scale ($N=8,786$) at the time of Wave 1 data collection. Scores on the Social Skills Scale ranged from 0 to 22. A score of 0-10 indicates low ability. Scores ranging from 11 to 16 suggests medium ability. Scores from 17-22 indicate high ability. An independent samples t-test was used to determine if students with ASD were different from other students who receive special education services on this domain. Results indicate that the null hypothesis of no difference between groups was rejected, $t(8,784) = 17.39, p < .001$. On average, students with ASD ($M=11.32, SD= 3.82$) scored lower on the Social Skills Scale when compared to students with other special education classifications ($M = 13.72, SD=3.86$). Means, standard deviations, and frequencies are provided in table 4.29.

Table 4.29 Indicators of Level of Functioning

Self-Care Skills Scale		
	Frequency	Mean (SD)
Disability Category:		
Autism	912	7.07(1.28)
Other	8212	7.43 (1.40)
TOTAL	9124	7.40 (1.39)
Mental Skills Scale		
	Frequency	Mean (SD)
Disability Category:		

Autism	906	10.59 (3.92)
Other	8030	12.73 (3.47)
TOTAL	8936	12.51 (3.58)
Household Responsibilities Scale (R)		
	Frequency	Mean (SD)
Disability Category:		
Autism	909	8.09 (2.82)
Other	8057	9.30 (3.02)
TOTAL	8966	9.18 (3.03)
Social Skills Scale		
	Frequency	Mean (SD)
Disability Category:		
Autism	864	11.32 (3.82)
Other	7922	13.72 (3.86)
TOTAL	8786	13.49 (3.92)

Multivariate Statistics

A multiple regression analysis (N= 1,214) was used to explain hourly wage earnings as a function of seven predictor variables: (1) Autism Diagnosis, (2) Functional Mental Skills Scale Score, (3) Gender, (4) Parent Income, (5) Student Role in Transition Planning, (6) Work Experience at the time of Wave 1 Data Collection, and (7) Instructional Setting where the student receives Language Arts Instruction. Variables were included based on their relation to the constructs reviewed in chapter three and based on non multicollinearity between them, using a combination of VIF and tolerance. Dummies were constructed for Student Role in Transition Planning, one of which was entered into the analysis (student takes an active role in the transition planning process). There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values.

Bivariate Correlations among variables are presented in Table 4.31. There were no leverage values greater than 0.10 and values for Cook's distance above 1.00. The assumption of normality was met, as assessed by a Q-Q Plot. The multiple regression model statistically significantly predicted Hourly Wage. The F statistic was statistically significant enabling the rejection of the null hypothesis of no relationship between hourly wage and the independent variables taken together. All seven variables added statistically significantly to the prediction, $p < .05$. R^2 for the overall model was 23.2% with an adjusted R^2 of 22.7%, a small size effect according to Cohen (1988). Functional Mental Skills Scale Score exhibited the strongest positive standardized coefficient ($\beta = 0.215$), followed by Student Work Experience ($\beta = 0.197$). All other things equal, for every one point increase in the student's Mental Skills Scale Score, there will be an increase of 0.281 in hourly wage. Similarly, all other things being equal, the presence of work experience adds 0.702 to hourly wage earnings. The student's role in transition planning, instruction in the inclusion setting, and parent's income also add to the student's hourly wage earnings. More specifically, all things being equal, the student taking an active role in the transition planning process adds 0.651 to hourly wage earnings and participating in language arts instruction in an inclusion setting adds 1.230 to hourly wage earnings. Similarly, all other things equal, for every one dollar increase in parent's income there will be an increase of 1.813 to hourly wage earnings. In contrast, a diagnosis of ASD and gender negatively impact hourly wage earnings. Specifically, all other things equal an ASD diagnosis subtracts 0.662 from hourly wage earnings and where being female subtracts 1.083 from hourly wage earnings. Regression coefficients, beta weights and univariate t-test for the predictor variables are provided in Table 4.32.

Table 4.30. Means and Standard Deviations for the analytic sample ($n= 1,214$) for Hourly Wage

	Mean	SD
Hourly Wage	9.07	3.66
Autism	0.09	0.29
Mental Skills Scale Score	13.35	2.79
Gender	1.35	0.48
Parent Income	\$48,734.50	24,222.19
Student Role in Transition Planning	0.10	0.30
Work Experience	1.09	1.03
Instructional Setting	0.49	0.50

Table 4.31. Bivariate Correlations among variables for Hourly Wage

	Hourly Wage	ASD	Mental Skills	Gender	Parent Income	Student Role	Work Experience
Measure:							
Hourly Wage	1						
ASD	-0.08	1					
Mental Skills	0.34	-0.09	1				
Gender	-0.14	-0.15	-0.04	1			
Parent Income	0.19	0.05	0.10	-0.04	1		
Student Role	0.13	-0.05	0.11	-0.01	0.10	1	

Work Experience	0.27	-0.12	0.15	0.04	0.10	0.07	1
Instructional Setting	0.31	-0.05	0.40	-0.02	0.15	0.12	0.14

Table 4.32. Regression Analysis Predicting Hourly Wage Earnings

	Regression Coefficient (B)	Standardized Coefficients (β)	t Statistic
ASD	-0.662	-0.052	-2.030*
Mental Skills Scale Score	0.281	0.215	7.711***
Gender	-1.083	-0.141	-5.510***
Parent Income	1.813	0.120	4.654***
Student Role in Transition Planning	0.651	0.053	2.075*
Work Experience	0.702	0.197	7.609***
Instructional Setting	1.230	0.168	6.028***
Constant	4.520		7.898***
R Square	0.232		
F Statistic	51.949***		
* $p < .05$; ** $p < 0.01$; *** $p < 0.001$			

A second multiple regression analysis (N=191) was used to explain postsecondary semester credits earned at a 2-year/community college or a 4-year college/university as a function of six independent variables: (1) Autism Diagnosis, (2) Classroom Behavior Scale Score, (3) Parent Income, (4) Student Role in Transition Planning at the time of

wave 2 data collection, (5) College Contact made by the transition team at the time of wave 2 data collection, and (6) Instructional Setting where the student receives language arts instruction. Variables were included based on their relation to the constructs reviewed in chapter three and based on non multicollinearity between them, using a combination of VIF and tolerance. Dummies were constructed for Student Role in Transition Planning, one of which was entered into the analysis (student takes a leadership role in the transition planning process at the time of wave 2 data collection). There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. Bivariate Correlations among variables are presented in Table 4.34. There were no leverage values greater than 0.12 and values for Cook's distance above 0.09. The assumption of normality was met, as assessed by a Q-Q Plot. The multiple regression model statistically significantly predicted Postsecondary Credits Earned. The F statistic was statistically significant enabling the rejection of the null hypothesis of no relationship between credits earned and the independent variables taken together. Five of the six independent variables added statistically significantly to the prediction, $p < .05$.

Controlling for all other factors, an Autism Diagnosis was not related to the number of credits earned. R^2 for the overall model was 18.7% with an adjusted R^2 of 16.0%, a small size effect according to Cohen (1988). College Contact by Transition Team exhibited the strongest positive standardized coefficient ($\beta = 0.191$), followed by Classroom Behavior Scale Score ($\beta = 0.173$). All other things equal, having a college or university contacted by the transition team during wave 2 adds 22.699 to the number of credit hours the

student earned. Similarly, all other things being equal, for every one point increase in the student's Classroom Behavior Scale Score there will be an increase of 3.833 in credit hours earned. The student's role in transition planning and instruction in the inclusion setting also add to the number of credit hours earned. More specifically, all thing being equal, the if they student takes a leadership role in the transition planning process during wave 2, there was an increase of 19.555 credit hours earned and participating in language arts instruction in an inclusion setting during wave 1 adds 19.774 to the number of credit hours earned. While parent income is statistically significant, interpretation of the regression coefficient indicates that, all other things equal, for every one dollar increase in a parent's income credits hours earned increased by .0001 (B=0.000). Regression coefficients, beta weights and univariate t-test for the independent variables are provided in Table 4.35.

Table 4.33. Means and Standard Deviations for the analytic sample ($n= 191$) for Number of Semester Credits Earned at a 2-year/Community College and/or 4-year College/University

	Mean	SD
Credits	56.43	58.99
Autism	0.09	0.29
Classroom Behavior Scale Score	12.50	2.67
Parent Income	\$54,791.55	\$24,223.92
Leadership Role	0.37	0.48
College Contact	0.57	0.50
Instructional Setting	0.65	0.47

Table 4.34. Bivariate Correlations among variables for Number of Semester Credits

Earned at a 2-year/Community College and/or 4-year College/University

	Credits	ASD	Classroom Behavior	Parent Income	Student Role	College Contact
Measure:						
Credits	1					
ASD	0.28	1				
Classroom Behavior	0.25	0.04	1			
Parent Income	0.19	0.19	0.09	1		
Student Role	0.25	-0.06	0.27	0.00	1	
College Contact	0.22	-0.01	0.10	-0.07	0.21	1
Instructional Setting	0.19	0.12	0.02	0.22	0.00	-0.04

Table 4.35. Regression Analysis Predicting Number of Semester Credits Earned at a 2-year/Community College and/or 4-year College/University

	Regression Coefficient (B)	Standardized Coefficients (β)	t Statistic
ASD	-3.371	13.718	-0.246
Classroom Behavior Scale Score	3.833	1.537	2.494**
Parent Income	0.0003	0.0002	2.274*
Leadership Role	19.555	8.603	2.273*

College Contact	22.699	8.107	2.800**
Instructional Setting	19.774	8.471	2.334*
Constant	-45.248		-2.161***
R Square	0.187		
F Statistic	7.031***		
* $p < .05$; ** $p < 0.01$; *** $p < 0.001$			

Chapter 5

DISCUSSION

Students with an educational classification of ASD comprise a broad spectrum of abilities and are a heterogeneous group. These students make up 8.3% of all students receiving special education services, and ASD is the fastest growing educational classification under IDEA Part B (U.S. Department of Education, 2016). When considered collectively, students with disabilities lag behind their typically developing peers in postsecondary education and employment attainment (Carter, Austin, & Trainor, 2011; Newman, Wagner, Cameto, & Knokey, 2009, Newman, et al., 2011). As a group, young adults with ASD are far less likely than most of their peers receiving special education services to access meaningful opportunities for postsecondary education, civic engagement, employment, and peer relationships in the early years after high school (Newman, et al., 2009).

As more students with these unique and varying needs begin to age out of the educational system, the demand for quality transition planning services that address the spectrum of ability within this population increases. While IDEA (2018) provides some basic guidelines, there is significant room for interpretation and individualization within these mandates. As such, practitioners are often left searching the available literature to determine the best way to provide students, families, and school personnel with some guidance in interpreting and implementing federal law. However, the best practices literature is limited and often does not address some of the unique needs of students with ASD (Wehman, 2013), given the core features of the classification. While adequate, evidence-based transition-planning services are needed for all students who receive

special education, the unique needs of students with ASD as a group must be considered separately. As such, the current study examined the school program variables, family variables, and student variables related to postsecondary education and employment outcomes for students with ASD.

The Selection of NLTS-2 variables was influenced by the Taxonomy of Transition Practices initially introduced by Kohler (1996) and expanded on by Kohler & Fields (2003). Additionally, Wehman's (2013) theoretical work and research completed by Wehman and colleagues (2014) that focus on the unique transition needs for students with ASD was considered. Descriptive statistical analysis was conducted to characterize the participants and their families and school and educational program characteristics. Crosstabulation analysis was used to analyze the bivariate relationships between relevant variables for the sample. Finally, multivariate statistical analysis was used to explain hourly wage earnings and postsecondary education outcomes in the sample. It is important to note that these results were not intended to be generalized to the greater population of students receiving special education services. The results presented in this study, and summarized in the following section, are only intended to provide a more detailed description of those included in the current study.

Evaluation of School, Classroom, Family, and Student Characteristics

On a percentage basis, students included in the sample were evenly distributed across income categories. In contrast, most of students with ASD were reported to live in homes where the annual income is over \$50,000, and on a percentage basis, students with ASD were overrepresented in this group. This finding is consistent with what is known about the families of children with an ASD diagnosis nationwide, and this may relate to the

tendency for higher-income families to seek out an ASD diagnosis when they see signs of difficulty, like speech and language delays and difficulties with emotional reciprocity, at an early age. Similarly, the sample of students with ASD in the current study is largely male, Caucasian, non-Hispanic or Latino, which is consistent with what is known about the population of youth with ASD in the United States (Baio, et al., 2018).

Concerning skill level, students in the sample were rated on various of domains, including mental skills and classroom behavior. The mental skills scale is a representation of adaptive mental ability based on parent rating. While this is not a substitute for a direct measure of cognitive ability, like an IQ score, it does provide a functional representation of the student's ability in the context of their daily environment. On average, students with ASD scored lower on the mental skills scale when compared to students with other educational classifications, despite the relatively low number of students in the sample who were dually diagnosed with ASD and ID. This finding indicates that, as a whole, students with ASD in this sample likely experienced a higher level of functional impairment across cognitive domains than students in other disability categories when these students are considered collectively.

Similarly, students in the sample were given a classroom behavior score that was based on teacher ratings. This scale reflects the frequency that the student completes homework on time, takes part in group discussions, stays focused on work, and does not withdrawal from activities. Again, on average, students with ASD scored lower than students with other disabilities. Again, this is consistent with what is known about students with ASD in the school setting. It is also consistent with the core features of both the DSM-5 diagnosis and the IDEA educational classification.

Evaluation of School Program Variables

Regarding to student variables that relate to the constructs discussed by both Kohler & Fields (2003) and Wehman (2013), most students in the sample reported not having any paid job experience at the time of Wave 1 data collection. Here, students with ASD differed from the rest of the sample. Compared to students with other disabilities, fewer students with ASD reported having paid job experience at the time of W1 data collection. Additionally, on a percentage basis, students with ASD were overrepresented in the sample of students without a paying job at the time of Wave 1 data collection. Similarly, while most students in the sample attended schools with school-to-work activities and employment services, there was not an equal distribution of students in schools with school-to-work activities and employment services. Results suggest that students with ASD attend schools with school-to-work and employment services less frequently than students with other disabilities. When considered collectively, these results suggest that students with ASD lag behind other students who receive special education services in this critical area of student development related to postsecondary employment outcomes. This finding also highlights a need for interventions that provide employment experience, like sheltered employment or internship opportunities, to be included in the transition plan for students with ASD.

Similarly, while most students in the sample were described as taking an active role and providing some input in his or her transition plan, most students with ASD were described as passively present in the transition planning process. Additionally, on a percentage basis, students with ASD were overrepresented in the group of students who did not attend their transition planning meeting. Similarly, on a percentage basis, students

with ASD were underrepresented in the group of students who took a leadership role in their transition plan. Consistent with previous research (Agran, Blanchard, & Wehmeyer, 2000; Shogren & Plotner, 2012), these results also suggest that students with ASD struggle to participate in the IEP and transition planning process when they are compared to other students receiving special education services. As such, Student Focused Planning needs to be emphasized in the transition plan for these students.

Evaluation of Student and Family Characteristics on Outcomes

The primary goal of this dissertation was to determine what school program variables explain postsecondary outcomes in education/training and employment for students with ASD. A secondary goal was to determine individual student and family variables are related to this relationship. Specific NLTS-2 variables were selected based on their alignment with the thematic finding of the literature regarding the traditional transition planning practices (e.g., Kohler, 1996; Kohler & Fields, 2003; Wehman, 2013) associated with post-school outcomes. Because missing data were such a pervasive issue, many variables of interest had to be excluded from the analysis. This issue is discussed in further detail in the limitations section of this chapter. However, it is worth noting here because this influenced the variable selected for inclusion in the current study. Variables needed to be related to the constructs of interest, but if missing data between groups exceeded 5%, the variable was not included. After considering both the relevance to the literature and missingness, the variables related to the Kohler and Filed (2003) Taxonomy of Transition Practices included in the analysis were student role in transition planning and work experience/college contact. Similarly, for these reasons, inclusion was selected as the variable to represent the work of Wehman (2013) and Wehman and

colleagues (2014). Parent income was used as a family variable, and gender, functional mental skills, and classroom behavior were used as student variables in the model evaluated in this dissertation. Results from the multivariate statistical analysis are summarized below.

A multiple regression analysis was used to explain hourly wage earnings as a function of seven variables: (1) Autism Diagnosis, (2) Functional Mental Skills Scale Score, (3) Gender, (4) Parent Income, (5) Student Role in Transition Planning, (6) Work Experience at the time of Wave 1 Data Collection, and (7) Instructional Setting where the student receives Language Arts Instruction. All seven variables added statistical significance to the equation. Functional Mental Skills Scale Score exhibited the most substantial positive standardized coefficient, followed by Student Work Experience. Of all of the independent variables entered, ASD diagnosis had the smallest effect on wage earnings. While inclusion did not appear to be as influential as mental skills and previous work experience in explaining hourly wage, it did increase hourly wage more than work experience and student role in the transition plan, which is heavily emphasized in the Kohler taxonomy. Gender and Autism diagnosis were the only two variables in the model that decreased wage earnings, where being female and having an ASD diagnoses led to a decrease in hourly wages.

A second multiple regression analysis was used to explain postsecondary semester credits earned at a 2-year/community college or a 4-year college/university as a function of six predictor variables: (1) Autism Diagnosis, (2) Classroom Behavior Scale Score, (3) Parent Income, (5) Student Role in Transition Planning, (6) College Contact made by the Transition Team at the time of Wave 1 Data Collection, and (7) Instructional Setting

where the student receives Language Arts Instruction. Here, five of the six independent variables added statistically significantly to the model and controlling for all other factors, and Autism Diagnosis was not related to the number of credits earned. College contact by the transition team, a variable emphasized in Kohler & Field's (2003) taxonomy, exhibited the strongest positive standardized coefficient. In this model, the student's role in transition planning and instruction in the inclusion setting also added to the number of credit hours earned. While both Kohler and Fields (2003) and Wehman (2013) discuss the importance of students taking an active leadership role in the transition planning process, only Wehman discusses the importance of inclusion.

When considered collectively, these results indicate that individual student variables are very influential in explaining postsecondary outcomes for students with disabilities. More specifically, when we evaluate postsecondary employment, functional mental skills are most influential in the equation. When we evaluate postsecondary education outcomes, classroom behavior ratings are the most significant contributor in explaining the number of credit hours earned. Interestingly, despite this, ASD, which is often associated with behavioral difficulties, was not related to the number of credits earned. In addition, inclusion in the general education setting for a primary content area (language arts) was significant in both models, even though results indicated that students with ASD attended schools where inclusion was available at a rate that was consistent with students who have other educational classifications in this sample. This highlights the need to think beyond traditional best practices models that often do not include inclusion practices as part of the approach. This appears to be particularly true for

students with ASD who are seeking employment as their primary goal after high school graduation.

Limitations

The NLTS-2 data were selected for use in this study because the research initiative was designed to provide a national description of the experience and achievement of young people as they transition to adulthood, and it was believed that this would provide a comprehensive, generalizable picture of the secondary school experiences in the transition to adult roles for secondary aged youths with disabilities. In addition, the large sample size was desirable because it enables the use of predictive statistics to explore the research questions. However, problems with missing data that impact any study utilizing large-scale extant data afflicted the current study and limited both the outcome variables and correlates that were available for evaluation. Additionally, the timeline of NLTS-2 data collection limits the practical implications of these results.

Students with ASD have significant strengths that have traditionally been underappreciated and underrepresented in the literature (Wehman, et al., 2014). The NLTS-2 data were selected for use because it would allow the researcher to evaluate a wider variety of post-school outcomes and provide a more comprehensive picture of success than what is reflected in much of the available literature, which tends to focus on post-school employment and education outcomes. Unfortunately, missing data were a concern across numerous variables throughout every analysis conducted in the current study. Many dependent variables of interest could not be included because missingness was too pervasive and not evenly distributed between students with ASD and students

with other disabilities. For this reason, the current study has limited definition of “postsecondary success” and includes only employment and postsecondary education outcomes.

Similarly, research about transition planning for students with ASD is often criticized for the underrepresentation of social-ecological correlates. The inclusion of these variables is necessary for the development of interventions beyond the individual child level. When measured at all, social-ecological correlates are typically derived from the family level, and we have limited knowledge of the interpersonal, social capital, social network, community, service system, and policy factors that may impact transition outcomes (Shattuck, et al., 2018). Again, the NLTS-2 data were selected because the study was so comprehensive, and the current study methodology was created with the hope that these data would capture a wide variety of correlates. However, missing data limited the ability to evaluate some variables that may influence the relationship between transition planning variables and post-school outcomes. As is the case with the majority of the available research, the current study focused solely on student and family characteristics.

As with all extant data analyses of large, nationally representative data sets, the NLTS-2 data were selected for analysis because of the possibility of generalizing these findings. However, this dissertation did not use weights when analyzing the data, limiting the generalizability of these findings to only the portion of students with ASD. In retrospect, either analyzing the weighted data or analyzing data from the group of students with ASD only would have been a better option. Additionally, listwise deletion further reduced sample size and power and produced potentially biased generalizations.

While missing data presented problems for the researcher in evaluating the originally hypothesized model, the way missing data and weights were handled substantially limits the generalizability and power of these findings.

It is also worth noting that the NLTS-2 data were collected between 2000 and 2010. There have been several notable changes made to the diagnostic criteria and IDEA since this time. The DSM-5 was introduced in 2013, and changes to the ASD diagnosis were significant. Notably, ASD now includes children that previously were identified with Asperger's and PDD-NOS under the Autism Spectrum umbrella. While the educational classification of ASD has not been changed and a child does not require a DSM-5 diagnosis to receive special education services with a classification of ASD, the two are inherently linked (Stichter, Stormont, Buranova, Herzog, & O'Donnell, 2021). It is reasonable to conclude that changes to the DSM-5 may have correlated with changes to the population of students receiving special education services with a classification of ASD under IDEA Part B. Additionally, IDEA was reauthorized in 2018, and updates to the IDEA Transition Regulations occurred in 2019. For these reasons, the results presented here are somewhat outdated.

In addition to limitations that come from the using large, nationally representative extant data, concerns regarding the diagnostic validity of ASD also limit these findings. The primary goal of this dissertation was to determine what school program variables explain postsecondary outcomes in education/training and employment for students with ASD. As such, group selection relied on information about the child's diagnosis. The variable used to group participants was derived from parent input about the child's diagnosis and confirmed by the child's school district. However, the quality of DSM-5

diagnoses, in general, have been scrutinized, and the ASD diagnosis has received a significant amount of criticism since the changes to the DSM-5 were proposed (McPartland, Reichow, & Volkmar, 2012). Concerns about the construct validity of the ASD diagnosis, which was intended to account for the heterogeneity of symptom patterns and treatment needs within this population, arise due to the lack of precision inherent within a diagnosis that encompasses such a spectrum of ability. This issue is amplified for diagnoses like ASD, where there is an overlap between clinical diagnosis and educational classification. Furthermore, research suggests that the educational eligibility of ASD does not always differentiate between students with and without autism (Stichter, et al., 2021). For these reasons, the practical implications of the results presented in this study are only as reliable as the information used to categorize participants and are limited by the lack of diagnostic validity both clinically and in the school setting.

Future Research & Implications for Practice

The current study has examined only two postsecondary outcomes, employment and education. These variables are the two that are most often evaluated in the literature. They are easy to define and measure and align with traditional views of postsecondary success. However, this does not provide a comprehensive view of a successful or full life. In addition to education and job attainment, it is essential to consider other factors like socialization and independent living. This is true for neurodivergent students and students may wish to pursue less traditional jobs, may prefer less traditional living arrangements and social interactions, and who may not want to prescribe to the “traditional” adult role. For these reasons, it is recommended that future research evaluate additional outcomes measures beyond just employment and education.

Similarly, this study does not include the perspective of any autistic students. The current literature base focuses on the unique needs of this population is based on diagnostic criteria that prioritize deficits in functioning, rather than focusing on the child's strengths and abilities. In addition, much of the current literature available about transition planning practices does not highlight the unique needs of students with ASD, and it also does not include their perspective, this study included. Their voice needs to be amplified. Responses from individuals with ASD, rather than parent or teacher reports alone, should be included in future research studies. Additionally, input from this population during the study design process should be considered. For example, it would be beneficial to determine how students with ASD define postsecondary success and what these individuals identify as their goals for the future. Once that is determined, we can evaluate whether or not our transition planning practices and policies prepare students with ASD for what they want to do when they graduate.

Inclusion in the general education setting for a primary content area (language arts) was significantly related to post-school employment and education outcomes. Inclusion is a significant aspect of programming for all students with disabilities, beginning at a young age. Additionally, it has been emphasized as a vital intervention approach for students with ASD. Research demonstrates that inclusion in the general education classroom correlates with better post-school outcomes for students with disabilities (Landmark, et al., 2010). Wehman (2013) highlights the importance of including students with ASD in the general education classroom as part of their transition programming because it provides the opportunity for students with ASD to access the general education curriculum while also creating an opportunity for these students to

meet and establish friendships with their peers. In general, information about inclusion practices at the high school level has been identified as an area of weakness in the literature (Shattuck, et al., 2018). Additionally, the research that exploring the experiences of students with ASD in inclusive high school settings in the United States is limited (Wehman et al., 2014). Practitioners are only able to draw conclusions from data that support the inclusion of these students during their elementary school years. The results of this study indicate that inclusion in a setting where the academic content is rigorous, like language arts, is an essential intervention for all students with disabilities and is something that practitioners should continue to promote. Additionally, this study points to a need for more research about the inclusion experience of high school students with an educational classification of ASD and the benefits beyond peer socialization.

Summary

In summary, the current study provided valuable information about the postsecondary transition planning practices for students with ASD implemented in high schools nationwide. Consistent with the literature (Kohler & Fields, 2003), student-focused planning, student development, and interagency collaboration correlate with postsecondary education/training and employment outcomes. In addition, consistent with what is known about the broader population of students receiving special education services (Landmark, et al., 2010) and the theoretical work (Wehman, et al., 2014), the current study demonstrates that inclusion in the general education setting in an academically rigorous content area is also related to postsecondary success in education/training and employment. This finding not only highlights the importance of including students with ASD in the general education classroom as part of their transition

programming, but it also speaks to the need for additional research about inclusion practices as part of the child's transition plan for students with ASD.

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APPENDIX A

Table 3.1. NLTS-2 Variables that were considered for inclusion as independent variables

Variable Label	Alignment with Model
School Program Variables:	
Student receives occupational vocational education instruction	Student Development
Student receives prevocational education instruction	Student Development
Behavior management programing is provided to the student.	Use of Positive Behavior Supports
Self-advocacy training is provided to the student	Student Focused Planning
Student with transition plan received instruction specifically focused on transition planning	Program Structure
Instructional Setting in which the student receives Language Arts Instruction (if received)	Components that address unique needs of students with ASD: Inclusion
Instructional Setting in which the student receives Mathematics Instruction (if received)	Components that address unique needs of students with ASD: Inclusion
The student has received a formal assessment of career skills or interest from or through the school system since starting High School	Student Development
The student has received career counseling from or through the school system since starting High School	Student Development
The student has received job readiness or prevocational training from or through the school system since starting High School	Student Development
The student has received instruction in looking for jobs from or through the school system since starting High School	Student Development

<p>The student has received internship/apprenticeship experiences from or through the school system since starting High School</p>	<p>Student Development</p>
<p>The student has received tech-prep programming from or through the school system since starting High School</p>	<p>Student Development</p>
<p>The student has received Entrepreneurship programming from or through the school system since starting High School</p>	<p>Student Development</p>
<p>The student has received other work experiences from or through the school system since starting High School</p>	<p>Student Development</p>
<p>The student has received specific job skills training from or through the school system since starting High School</p>	<p>Student Development</p>
<p>The student has received referrals to potential employers or other job placement supports from or through the school system since starting High School</p>	<p>Student Development</p>
<p>The student has received job coaching from or through the school system since starting High School</p>	<p>Student Development</p>
<p>Primary goals for the student in the 2004-2005 School year: Build social Skills</p>	<p>Components that address unique needs of students with ASD: Social Skills</p>
<p>Primary goals for the student in the 2004-2005 School year: Improve appropriateness of general behavior</p>	<p>Components that address unique needs of students with ASD: Social Skills</p>
<p>Primary goals for the student in the 2004-2005 School year: Increase self-advocacy or self determination</p>	<p>Student Focused Planning</p>
<p>The following services have been provided to the student from or through the school system during this school year (including services the school contracted form other agencies): Behavior intervention/specialist</p>	<p>Components that address unique needs of students with ASD: Use of Positive Behavioral supports</p>
<p>Student with transition plan received instruction specifically focused on transition planning</p>	<p>Program Structure</p>

For the period following high school, the <u>primary goal</u> of this student's educational program is to prepare him or her for the following: Attend a 2- or 4-year college	Student Development
For the period following high school, the <u>primary goal</u> of this student's educational program is to prepare him or her for the following: Postsecondary vocational training program	Student Development
For the period following high school, the <u>primary goal</u> of this student's educational program is to prepare him or her for the following: employment	Student Development
For the period following high school, the <u>primary goal</u> of this student's educational program is to prepare him or her for the following: sheltered employment	Student Development
For the period following high school, the <u>primary goal</u> of this student's educational program is to prepare him or her for the following: supported employment	Student Development
Students transition plan or EIP specifically states what course of study or kinds of classes this student should pursue in order to meet his post school transition goals	Program Structure
Active Participant in transition planning: Student	Student Focused Planning
Student's role in his or her transition planning	Student Focused Planning
The following have been contacted by the school or school system regarding programs or employment for this student when s/he leaves high school: colleges	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: postsecondary vocational schools	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: state vocational rehabilitation agency	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student	

when s/he leaves high school: other vocational training program	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: US Military	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: potential employers	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: job placement	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: supported employment	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: sheltered workshops	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: mental health agencies	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: social security administration	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: supervised residential support agencies	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: adult day program	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: other social services agency	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student	

when s/he leaves high school: congregate care facilities or institutions	Interagency Collaboration
The following have been contracted by the school or school system regarding programs or employment for this student when s/he leaves high school: other agency	Interagency Collaboration
Information about the services available after high school related to this student's kind of disability has been provided to his or her parents/guardians by the school system	Interagency Collaboration
Youth met with teachers to set postsecondary goals	
Amount of choice youth reported having over IEP goals	Student Focused Planning
Youth who attended IEP wanted to be more/less involved	Student Focused Planning
Active Participant in transition planning: Parent/Guardian	Student Focused Planning
	Family Involvement

APPENDIX B

Table 4.3. Analysis of Missing Data

N	Description	% Missing Overall	% Missing ASD	% Missing Other
School Characteristics				
4817	Number of students receiving Special Education with ASD	47.8%	49.5%	47.6%
3903	School develops transition plan	57.7%	61.8%	57.2%
3896	Age school beings transition plan	57.8%	58.2%	57.7%
4831	School has college/career awareness programing	47.6%	50.1%	47.4%
4831	The school has school-to-work activities and employment services	47.6%	50.1%	47.4%
4028	The School has a peer support program that provides social and/or academic support to students with disabilities such as a peer buddy program	56.4%	60.6%	55.9%
3792	School provides instruction that focuses on transition planning for students with disabilities	58.9%	63.2%	58.4%
4062	Inclusion is available	56.0%	60.3%	55.5%
4649	Urbanicity of School student attends	49.6%	49.1%	49.7%
Program Characteristics				
8656	Youth has an IEP	6.2%		
8648	Youth has a 504 Plan	6.3%		
8550	Where family learns about services	7.3%		
8617	Sum of Serviced received from the school	6.6%		
8843		4.2%		

8839	Child received psychological or mental health/counseling services through school	4.2%		
8582	Child receives social work services through school	7.0%		
8621	Occupational/life skills therapy is provided by district	6.6%		
8923	Career counseling is provided by district	3.3%		
4640	Youth has done volunteer/community services in the past 12-months	49.7%	47.1%	50.0%
4640	Behavior Management programing is on the student's IEP/504	49.7%	47.1%	50.0%
4305	Self-Advocacy training is on the student's IEP/504	53.3%	50.7%	53.6%
3634	There has been planning for this student's transition to adult life	60.0%	59.5%	60.7%
3453	Age when transition planning began	62.6%	60.7%	62.8%
3697	Student with transition plan received instruction specifically focused on transition planning	59.9%	58.8%	60.1%
3711	Students transition plan or IEP specifically states what course of study or kinds of classes this student should pursue in order to meet his post school transition goals	59.8%	58.9%	59.9%
3598	Suitability of program for preparing student for transition goals	61.0%	59.8%	61.1%
	Student's role in his or her transition planning			
Classroom Characteristics				
4724	Class Size	48.8%	47.4%	49.0%
4578	Classroom Behavior Scale	50.5%	52.0%	50.2%

8403	Overall level of work at school	8.9%		
8668	How well youth gets along with students at secondary school	6.1%		
8691	How well youth gets along with teachers at secondary school	5.8%		
Family Characteristics				
8636	Number of people who live in household.	6.4%		
8643	Number of children who live in household.	6.3%		
8637	Number of adults who live in household	6.4%		
8428	Living Arrangements	8.7%		
8374	Youth lives with parents who never married	9.3%		
8970	Language other than English spoken in home	2.8%		
8631	There is another child who lives in the home with a disability	6.5%		
8647	An adult in the household has a disability/special need	6.3%		
8331	Income Categories	9.7%		
8618	Household received SSI within the past 2 years	6.6%		
8460	Education Status of Head of Household	8.3%		
Student Characteristics				
9228	Gender	0.0%		
9227	Ethnicity	0.0%		
9200	Youth is of Hispanic/Latino Origin	0.3%		
9223	Age at time of W1 Interview	0.1%		
8497	Age of youth when started to receive services	7.9%		
9228	Youth has a secondary disability	0.0%		
8688	Youth ever held back a grade	5.9%		

8605	Youth currently has a paid job	6.8%		
8648	School is challenging for youth	6.3%		
8702	Youth enjoys school	5.7%		
8576	An adult in school knows/cares about youth	7.1%		
8669	School is good at meeting youth's needs	6.1%		
8677	Youth is getting needed supports/services from school	6.0%		
9124	Self-Care Skills Scale	1.1%		
8936	Mental Skills Scale	3.2%		
8966	Household Responsibilities Scale	2.8%		
8786	Social Skills Scale	4.8%		
Outcome Variables				
2400	Hourly wage young adult earns/earned at his/her most recent job	74.0%	75.3%	73.9%
1293	Total number of semester credits earned at either a 2-year community of 4-year college/university	86.0%	89.0%	85.6%

