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Work Based Learning: Employment and Educational Attainment of Autistic Students

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Work Based Learning: Employment and Educational Attainment of Autistic students

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Education

by

James Yang

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ABSTRACT OF THE DISSERTATION

Work Based Learning: Employment and Educational Attainment of Autistic students

by

James Yang

Doctor of Philosophy in Education

University of California, Los Angeles, 2023

Professor Connie L. Kasari, Chair

Adults with Autism spectrum disorder are more likely to be unemployed and unengaged in post-secondary education opportunities compared to their peers with and without disabilities. The negative employment and post-secondary educational outcomes may be related to specific or combination of individual, family, community, and school factors. Studies have highlighted the differences in employment and educational outcomes based on ethnicity\race, socio-economic status (SES), cognitive level, gender, adaptive functioning, and parent\family involvement. However, these studies tend to be over represented by middle to upper class white males, which can lead to misleading findings or limit the generalizability of results. The current study will use a large dataset from a diverse metropolitan school district to provide descriptive information of the students with ASD who received Work Based Learning (WBL), a vocational strategy to promote employment and educational outcomes. There are 3 goals of the study, 1) characterize

autism eligible students that participated in WBL, 2) investigate the predictors of WBL participation in autism eligible students, and 3) characterize the post-secondary outcomes (employment and education) of autism eligible students that participated in WBL experiences. Findings from this study will further our understanding of which autism eligible students are receiving WBL opportunities and which ones might benefit most from WBL experiences.

The dissertation of James Yang is approved.

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TABLE OF CONTENTS

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Schlink, A., Baczewski, L., **Yang, J.W**., Nocker, Y., Gulsrud, A., & Kasari, C.(2019, May). Relationship between child dysregulation and parenting stress scores in toddlers with ASD. Poster presented at the International Meeting for Autism Research (IMFAR), Montreal, Quebec, Canada.

Yang, J.W., Pizzano M., Schlink A., Gulsrud, A., & Kasari, C. (2020, April). Adaptive Functioning in Toddlers with Autism Spectrum Disorder. Poster presented to the Gatlinburg Convention, San Diego, CA, USA.

Introduction

Employment Outcomes for Autistic Adults

Autistic adults have been shown to be more disadvantaged economically compared to other disabled adults (Roux et al., 2013). One reason for this disadvantage could be due to low employment rates for this population. Autistic adults have the lowest employment rates compared to their peers with other disabilities (Newman et al., 2011; Shattuck, Narendorf, et al., 2012). Taylor and Seltzer (2011) found employment rates ranged between 4.1% and 11.8%, regardless of cognitive functioning level in their subsample of autistic young adults that recently exited the school system. Of those that were employed, only 6% were in competitive employment, 12% were in supported work settings, and zero participants worked full time (Taylor & Seltzer, 2011). In a separate study on autistic adults from the United Kingdom, 33% of the sample obtained some sort of employment however only two individuals were receiving a full-time salary. Only 13% were in competitive employment situations and the other 18% were placed in sheltered or supported working environments (Howlin et al., 2004). Eaves and Ho (2008) looked at a sample of autistic young adults in Canada and found that only 4% were competitively employed and 45% of their sample have never been employed in their lifetime. In a US sample of adults with ASD, 22% reported paid employment, with half only working 1-9 hours a week and majority were placed in supported or special placements (Gotham et al., 2015). These studies show that unemployment in autistic transition aged youth and adults is an issue that is prevalent across countries and cultures. Additionally, when autistic individuals are employed, they tend to be given less hours, lower wages, and menial jobs (Nord et al., 2016; Taylor & Seltzer, 2011).

Post-Secondary Education Outcomes for Autistic adults

Autistic adults have also been shown to be more disadvantaged educationally compared to other disabled adults (Roux et al., 2013). Autistic transition aged youth are leaving high school to participate in post-secondary education opportunities at lower rates compared to the general population and other disabled students (Newman et al., 2011; Shattuck, Narendorf, et al., 2012). Even though autistic adolescents express strong aspirations to attend post-secondary educational institutions (Camarena & Sarigiani, 2009) they exhibit low rates in post-secondary education attendance and graduation (Cederlund et al., 2008; Eaves & Ho, 2008; Howlin et al., 2000, 2005; Szatmari et al., 1989; Taylor & Seltzer, 2011).

Eaves and Ho (2008) found that 30% of their sample attended some form of post-secondary education, with only one participant attending a four-year university. None of the participants who attended post-secondary education in this sample completed their degree at follow up. In a separate large US population based sample of adults with ASD the researchers found 12.1% attended a 4 year university, 28% attended a 2-year university, and 9.3% attended a vocation or technical education program (Shattuck, Narendorf, et al., 2012). The Australian Bureau of Statistics reported that only 19% of adults with ASD received various levels of post-secondary completion (certificate, diploma, Bachelor's degree or higher). This rate was significantly lower when compared to adults with other disabilities (50%) and adults without disabilities (59%) in Australia (Australian Bureau of Statistics, 2013).

Post-secondary education completion in the general population has been found to be linked to higher rates of employment (Booth, 1991; Ma et al., 2016). Similar relationships between greater levels of education and higher employment rates have been found in autistic transitioned aged youth and adults (Chiang et al., 2013; Lawer et al., 2009; Migliore et al., 2012).

The low rates of employment and post-secondary participation for autistic transition aged youth highlight the importance of implementing strategies and practices during school to promote better outcomes. One strategy used in school-based settings to improve these outcomes is Work-Based-Learning (WBL).

Work Based Learning

Work-Based-Learning (WBL) is an educational strategy that connects school-based instruction with real world work experiences to promote learning and access to future educational and employment opportunities for high school students (Darche et al., 2009). Work-Based Learning (WBL) encompasses a variety of educational learning opportunities. The key component to any WBL experience is the support and contribution it has on students' path to adult employment or post-secondary education (Hughes & Carter, 2000; Luecking, 2009).

Activities associated with WBL include a range of learning and real world experiences for students that increase in the level of intensity over time (Luecking, 2009). WBL can start as early as elementary school with less intense activities like learning about different careers in the classroom, listening to guest speakers, school presentations, career days, and work place tours or field trips. These early experiences promote career exposure and exploration in students. Middle school and early high school students can move on to activities like job shadowing to learn more about the day to day experiences and expectations of work settings. This progression leads to more intense activities in high school like service learning, internships, volunteering, and other school-based enterprises in high school settings. These practices provide in-depth exposure and engagement with activities and experience that can have positive benefits after high school graduation (Darche et al., 2009; Luecking, 2009).

Learning in the classroom and real-world work experiences build upon each other and it is important for educators to implement these strategies early in students' educational journey to promote skill readiness, exposure to opportunities, confidence, self-determination, knowledge, and to identify supports, accommodations, and strategies that might be needed for them to succeed in educational and employment settings beyond high school. WBL experiences provide opportunities for students to learn specific occupational skills in addition to "soft-skills" which are essential for succeeding in work environments. "Soft-skills" are behaviors and skills that are useful and can be generalized to almost all work place settings, including social skills, following directions, self-advocacy, and working as a team (Luecking, 2009; Schulz, 2008). It is important to highlight that WBL is not a manualized intervention but an educational and vocational strategy that can be employed with all students in education settings. WBL strategies and intensity can vary depending on the student capabilities, curriculum, and placement within educational settings and geographical locations.

Types of Work Based Learning Experiences. Understanding and identifying the different types of WBL experiences can help educators, families, service providers, and students plan for meaningful opportunities that may lead to positive employment and post-secondary educational outcomes after high school. Seven WBL experiences were identified and highlighted by Luecking (2009). Identified WBL experiences include: *career exploration, job shadowing, work sampling, service learning, internships, apprenticeships, and paid employment* (see Table 1 for descriptions of experiences).

Benefits of Work Based Learning Experiences For Students. A systematic review of evidence based predictors of post school outcomes found that career awareness, occupational courses, paid work experience, student support, transition programs, vocational education, and

work study were predictors of positive employment, education, and independent living (Test et al., 2009). These experiences can be obtained through WBL experiences in educational settings. Gaining work experience or participation in work based learning during high school is one of the strongest predictors of employment in adulthood for youth with disabilities (E. W. Carter et al., 2012; Dong et al., 2016; Luecking et al., 2018; Wehman et al., 2014). Students with disabilities that engage in either paid or unpaid work experiences during high school are significantly more likely to achieve employment after leaving school (E. W. Carter et al., 2009, 2012; Landmark et al., 2010; Lindstrom et al., 2011; Luecking & Wittenburg, 2009; Williams-Diehm & Benz, 2008).

Through WBL experiences, students are given the opportunity to learn about different career areas, explore different work styles, preference of occupation, realize how they learn best, and what supports are needed and available (Cease-Cook et al., 2015; Luecking, 2009). WBL experiences have been shown to improve self-esteem in all students, with and without disabilities, educate and reinforce rudimentary academic and technical skills, promote better understanding of workplace culture and expectations, and help students build a social network for future job opportunities and relationships (Bailey & Hughes, 1999; Haimson & Bellotti, 2001; Hoerner & Wehrley, 1995; Wehman, 2013). These WBL experiences also expose students to new and different work and career options that they would not have been exposed to or aware of their potential for them. For students with disabilities, exposure to the range of opportunities and career options is very critical for their future. Students with disabilities, including autistic students, are often placed on alternative curricula and in segregated classrooms where exposure to opportunities and career options can be very limited. In addition to the benefits of exposure and experiences, WBL knowledge can serve as a means to identify specific supports in the

workplace that students with disabilities may need to engage and pursue future employment and career opportunities (Hughes & Carter, 2000).

WBL provides relevance and meaning to the academic curriculum by connecting learning in the classroom with experiences in the workplace and exposing students to wide and diverse options in careers. Some additional benefits include higher order critical thinking, greater motivation for students to engage in school and work by connecting work done in the classroom with personal and career interests of students. Students are more likely to be motivated to develop technical skills related to careers and improve academic learning when they have agency in their choices and options (Shogren, Wehmeyer, & Palmer, 2017). WBL experience can provide spaces for identity formation in addition to expanding the social networks of students. Identity formation and increased self-efficacy are important psychological and social factors related to overall development of individuals (Cote & Levine, 2014). By linking students with mentors, more knowledgeable peers, other professional\caring adults and meaningful experiences in the context of WBL, it can provide opportunities for students to increase their confidence, competency, self-esteem and to believe that they have a purpose in the world after high school (Benard, 2004).

Representation

Research studies related to employment and postsecondary education outcomes amongst autistic individuals and autism research in general tend to be overrepresented by white male participants from upper-middle Socio-Economic-Status (SES) backgrounds (Safer-Lichtenstein et al., 2019; West et al., 2016). A study examining the diversity in Autism research related to Evidence Based Practices (EBP) by West et al. (2016) found that participants in these studies

were primarily white (63.5%) and other racial and ethnic groups were significantly less represented.

Ethnically diverse individuals with ASD and their families are and have been underrepresented in ASD research (Hilton et al., 2010; Kistner & Robbins, 1986; Pierce et al., 2014; Tek & Landa, 2012). In a systematic review regarding disparities based on race and ethnicity, in the context of transition to adulthood, authors excluded 60% of studies from its initial search because descriptors or outcomes related to race or ethnicity were excluded from analyses (Eilenberg et al., 2019). Pierce et al. (2014) examined the overall reporting of race and ethnicity in three prominent ASD-related journals from 2000-2010, and discovered that 72% of articles did not present racial or ethnic descriptors of their research participants. Of the small portion of studies that reported racial and ethnicity descriptors, only 46% of the studies included race and ethnicity in their analyses. A separate review on school-based interventions for students with ASD by Machalicek et al. (2008) discovered only 22% of the studies described and identified the ethnicity or race of the research participants from school settings. The inconsistencies in reporting ethnicity and race in ASD research are relevant because there is a small, emerging body of research related to how racial and ethnicity differences influence individuals with ASD and their outcomes. The results of these studies suggest that over-arching generalizations about significant results are made without considering the overall applicability across differences in demographic groups (Dyches et al., 2004; Pierce et al., 2014).

Factors related to employment and education outcomes

Ethnicity and Race. The under representation of minority groups in autism research may cause issues to external validity, mixed results, or even erroneous findings. As the field progresses to provide ethnicity and race descriptors and include them in their analyses, it is still

important to be aware (but interpret with care) the associations between ethnicity\race and post-secondary outcomes (employment and education) that have already been discovered.

Autistic students from ethnic and racial minority groups are less likely to acquire competitive employment compared to Autistic students that are white (Alverson & Yamamoto, 2017; Chen et al., 2015; Kirby, 2016; Shattuck, Narendorf, et al., 2012). Autistic students who are Latinx or African American are overall less likely to enroll in post-secondary education opportunities compared to their white peers (Shattuck, Narendorf, et al., 2012). Other studies related to transition planning to promote post-secondary outcomes (education and employment) found that autistic students that are African American or Latinx are less likely to engage in preparatory activities related to education beyond high school, such as being included in general education classrooms, passing required graduation exams, and participating in career and technical education compared to white peers (Baer et al., 2011). Additionally, autistic students that are African American are significantly less likely to actively participate in transition planning meetings compared to their autistic white peers (Griffin et al., 2014; Wei et al., 2016). The lack of engagement in activities and opportunities related to transitions in high school may be contributing to poor post-secondary education and employment (Chiang et al., 2012, 2013; Halpern et al., 1995). It is also possible that autistic minority students are not participating in activities related to transition planning due to past negative experiences with school, health, or government representatives.

Gender. ASD is notably more prevalent in males than in females, with a ratio of 4.3 males to 1 female (Fombonne, 2003). Results concerning gender differences in relation to core symptoms of ASD have been mixed. While some studies have reported gender differences in social interactions, communication skills, and stereotype behaviors (Bölte et al., 2011; A. S.

Carter et al., 2007; Holtmann et al., 2007; McLennan et al., 1993), others have reported no differences (Banach et al., 2009; McLennan et al., 1993). Several studies have shown that females with ASD tend to have worse employment and PSE outcomes compared to males with ASD. In a UK sample of 60 (49 males and 11 females) adults with ASD the authors found that 24 men (49%) engaged in paid work versus only 1 woman (9%) (Howlin et al., 2014). A separate study focused on correlates of employment and PSE found that none of the women (15) in the study were consistently engaged in employment or PSE activities, while 31% of men (18) were able to be consistently engaged in activities related to employment or PSE (Taylor et al., 2015). A longitudinal study by Taylor and Mailick (2014) found that women's vocational index scores declined at a significantly greater rate compared to men over time. The vocational index score represents the level of engagement in employment and education activity. The average woman's vocational index score declined 15 times more than the average male's score. Women tend to have worse employment and PSE outcomes however, both genders exhibit great challenges in employment and education attainment.

Socio-economic status (SES). Socioeconomic status (SES) encompasses many factors including household income, caregiver education and occupation. Differences in SES often lead to inequalities in access to resources in many realms but is also prominent in Autism (American Psychological Association, 2016). In autism intervention and treatment research, SES is important because there are clear disparities between higher SES families and lower SES families in access, treatment, and resources. Families with lower SES tend to face substantial barriers centered on financial costs and time commitment of treatment studies (Carr & Lord, 2016; Ratto et al., 2016).

Students with ASD from low income families were significantly less likely to attend and participate in transition planning meetings related to post-secondary education (PSE) compared to the higher income peers and families with ASD (Griffin et al., 2014; Wei et al., 2015). Transition aged youth from families with higher household income were significantly more likely than lower income households to be enrolled in PSE controlling for severity of ASD symptoms (Shattuck, Narendorf, et al., 2012; Taylor & Seltzer, 2011; Wei et al., 2015). Six separate studies using the NLTS2 public data set found association between lower household income and lower rates of attending 2 or 4 year colleges (Chiang et al., 2013; Liptak et al., 2011; Roux et al., 2015; Shattuck, Narendorf, et al., 2012; Wei et al., 2015, 2016).

Similar themes were present when examining employment outcomes of autistic students. Autistic students from lower income households were less likely to be engaged in paid employment compared to higher income peers (Chiang et al., 2013; Kirby, 2016; Liptak et al., 2011; Roux et al., 2013; Shattuck, Narendorf, et al., 2012). Chen, Sung, & Pi (2015) investigating services related to vocational rehabilitation in autistic adults found that participants who received government benefits like Supplemental Security Income (SSI), which is commonly used as a proxy for household income (one aspect of SES), were less likely to engage in competitive employment compared to those adults who were not eligible. Roux et al., (2013) found that higher household income was associated with higher employment achievement in autistic young adults. Higher household income was associated with higher levels of service use or social capital (Shattuck et al., 2011) which may have effects on employment outcomes. Social capital has been shown to be associated with higher rates of employment in the general population (Granovetter, 1995)and might be applicable to autistic young adults.

Family or Parent Involvement. Families and parents play a huge role in the experiences of individuals with ASD. Family involvement in education is important and can benefit all students but it is imperative for students with disabilities and their success in school and beyond. Families can take on the role of educator, advocates, role models, and support system in a consistent and stable manner during the difficult transition from high school to adulthood.

Since the passage of Education for All Handicapped Children Act (EHA, P.L. 94-242) in 1975 the involvement of parents in educational planning has been steadily growing. The EHA legislation highlighted the Individualized Education Plan (IEP) as the cornerstone of special education identification, student assessment, service definition and goal setting (Fish, 2008). School districts are responsible for scheduling and facilitating IEP meetings with parents, to discuss and determine critical aspects related to student's education and transition planning (Drasgow et al., 2001). EHA also emphasized that students are encouraged to participate in their own IEP meetings, when appropriate (Gillespie & Turnbull, 1983).

Under the Individuals With Disabilities Education Improvement Act (IDEIA, 2004), students are to have an Individual Transition Plan (ITP) as part of their IEP to prepare for life after high school. The ITP process can start as early as age 14, but must be started no later than age 16. Parent or family involvement and expectations have been found to be related to student participation related to transitions. Students with ASD are less likely to attend and actively participate in transition planning meetings compared to students with other disabilities . Students with parents that are actively involved in their education and have ongoing discussions about transitions at home are more likely to attend and actively participate in their transition planning (Griffin et al., 2014). Higher parent expectations related to postsecondary education opportunities were positively correlated to student attendance and participation in transition

planning (Wagner et al., 2012). One study examining best practices in transition to adult life found that students with disabilities whose parents were involved in their education were more likely to be employed and enrolled in postsecondary education after high school (Papay & Bambara, 2014).

Inclusion into General Education Curriculum . Inclusion of autistic students into general education settings is considered the best recommended practice and is supported by the 2004 amendments to Individuals with Disabilities Education Act (IDEA). Studies have shown better post school outcomes for disabled students that participated in inclusive general education curriculum (Colley & Jamison, 1998; Williams-Diehm & Benz, 2008). Full inclusion into general education settings for disabled students can lead to attainment of general education diplomas like their peers without disabilities. Graduating high school with a general education diploma has been connected to better employment rates after high school (Rabren et al., 2002) in addition to qualifying students with disabilities for military service or enrollment to postsecondary education opportunities (Test et al., 2009).

Other individual characteristics related to outcomes

Impairments in education and employment outcomes for transition aged youths leaving high school can be linked to individuals' characteristics in abilities across multiple domains. Cognitive levels, communication abilities, adaptive functioning level, co-occurring mental health and medical issues, and social skills are all factors related to employment, education, and other important outcomes related to adulthood (Howlin & Moss, 2012; Shattuck, Roux, et al., 2012). This is consistent with other studies that have highlighted the association between developmental impairments of ASD and higher risk of disengagement in adulthood (Seltzer et al., 2004).

Adaptive functioning skills are often considered to be the best predictors of outcomes for adults with ASD over and above cognitive and language abilities (Farley et al., 2009; Saulnier & Klaiman, 2018). Higher functional skills are associated with higher odds of education or employment participation (Roux et al., 2013). Deficits in functional skills are consistently associated with poorer employment and education outcomes in autistic adults (Shattuck, Narendorf, et al., 2012).

More impairments in communication or language abilities were related to lower odds of ever being in engaged in paid employment (Roux et al., 2013). Taylor and Seltzer (2011) found amongst their sample of young adults with ASD that almost 48% of young adults without ID were engaged in some level of post-secondary education versus only 2% of young adults with ID.

Self-determination is defined as "acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influences or interference" (Wehmeyer, 1992; Wehmeyer et al., 1996). Causal agency implies that outcomes are purposeful, and the actions are performed to achieve the purposeful outcome (Sands & Wehmeyer, 1996). A causal agent is someone who makes or causes things to happen in his or her life (Wehmeyer et al., 1996). The actions they perform are made with intent to shape their future and destiny. Individuals that engage in self-determined behaviors can be labeled as self-determined, and considered to possess the dispositional characteristic of self-determination (Wehmeyer, 1997). Higher levels of self-determination are commonly associated with greater academic achievement (Shogren, Wehmeyer, & Burke, 2017) and increased postsecondary or adult outcomes (Dean et al., 2017; Shogren, 2013). Instruction in the skills associated with self-determination have also been linked to enhanced academic outcomes (Shogren & Plotner, 2012)

and improved access to general education curriculum for students with disabilities (Lee et al., 2008; Palmer et al., 2004) . Higher levels of self-determination in individuals with disabilities has also been correlated to positive adult outcomes. A single case study of individuals with intellectual disability found that self-determination instruction was related to skills associated with employment acquisition and all participants in the study experienced positive changes in job status (Dean et al., 2017). A separate study by Shogren and colleagues (2013) followed 779 students with disabilities and concluded that higher self-determination levels at the end of high school predicted the level of community access one and two years after high school.

Current Study

Although research suggests the benefits of WBL experiences on employment and education outcomes for autistic students, less is known about which autistic students participate in WBL experiences in school settings. The purpose of this study is to characterize autistic transition aged students that participated in WBL opportunities and their post-secondary outcomes (employment and education) one year after leaving the high school education system. The current study will identify and describe students who received WBL in a large diverse metropolitan school district and highlight the student characteristics related to placement in the WBL program. Employment and post-secondary outcomes will be characterized at the one year follow up after leaving high school. Examining the predictors to WBL participation and describing student employment and post-secondary education outcomes after high school will help elucidate strategies and programs that school systems can implement to promote vocational and educational success for students served under Autism eligibility. The current study addresses the following research questions:

1. What are the characteristics of Autism eligible students who participated in a school-based WBL program?
2. When do Autism eligible students participate in WBL opportunities and how many years of WBL do they complete?
3. Do student characteristics (age, gender, race\ethnicity, income, type of school, curriculum, and inclusive settings) predict WBL placement for students served under autism eligibility?
4. What are the employment outcomes of autism eligible students that participated in WBL, one year after leaving school?
5. What are the post-secondary educational outcomes of autism eligible students that participated in WBL, one year after leaving school?

Methods

Participants

The current study used data collected from administrative records of a large metropolitan school district between the academic years of 2007 – 2008 to 2018 – 2019. Participants were drawn from the original dataset (n = 224,978) that spanned across 12 academic years (2007-2008 to 2017-2018) and across grade levels (Transitional Kindergarten/Kindergarten through 12th grade). The current study focused on the experiences of autism-eligible high school students and their post-secondary attainment (education and employment). A subsample of students was created from the original dataset (n = 224,978) obtained from the school district administration office. Inclusion in the current study required participants to meet the following criteria according to administrative records: (1) autism-eligible students who received special education services as noted in their individual education plan (IEP), (2) between the ages of 16 – 23 years

old and, (3) attended school between the academic years of 2011 – 2012 through 2016 – 2016 (6 total academic years). First, only autism-eligible students were identified from the original data set (n = 29,356). From the subset of the autism-eligible students, those between the ages of 16-23 were selected (n = 6645), and finally only academic years between 2011 – 2012 through 2016 – 2017 (n = 4057) was selected (see table 2 for demographic information). The academic years of 2011–2012 through 2016–2017 were selected based on available WBL participation data to the research team.

Table 2. *Student Characteristics of all autism-eligible students (N = 4057)*

	n	**%**
Student Characteristics		
Gender		
Male	3369	83%
Female	688	17%
Ethnicity\Race		
African-American	573	14.10%
Asian	215	5.30%
Hispanic	2109	52.00%
White	939	23.10%
Other	221	5.45%
Free and Reduced Lunch Status		
Qualified	1871	46.10%
Not Qualified	2186	53.90%
Neighborhood Income Category (n = 3965)		
Under $40,000	889	22.40%
$40,000 - $80,000	2600	65.60%
$80,000	476	12.00%

Measures

Outcomes

The primary outcomes of interest in the current study are WBL participation and whether students were able to obtain employment or post-secondary education opportunities one year after leaving high school. Information about WBL participation was gathered from the Individual Education Plan (IEP) and other administrative documents from the district. Employment and post-secondary outcome data were collected via telephone interview one year after students left high school. The follow up information related to employment and educational engagement after high school was collected by the lead teacher or instructor that educated the student before leaving high school.

Work Based Learning

Work-based learning program implemented at the current school district provides students an opportunity to identify career goals through assessments, classroom instruction time, and real work experience opportunities. The ultimate goals for the program are successful work experiences which may even lead to direct hire opportunities for students. By pairing WBL opportunities and classroom learning, it can make learning opportunities more meaningful and relevant to students interests and even motivate students to engage in positive post-secondary outcomes (employment and education). Work Based Learning is a binary variable (Yes or No) and it indicates whether the student participated in WBL opportunities during high school.

Employment

The outcome variable of employment captures whether students were able to obtain employment opportunities one year after leaving high school. Employment is defined as full or part-time work with fair pay and benefits (paid vacation, sick time, health insurance, and

retirement plans). The Employment outcome is categorical with three levels; Yes employment, Some employment, and No employment. For statistical analytic purposes, this variable was dichotomized to Yes and No employment. Both levels of employment (yes and some) were collapsed to "Yes" employment and "No" employment was kept as is.

Post-secondary education

The post-secondary education outcome variable is categorical and exhibits a wide range of educational opportunities after leaving high school. The outcome variable of post-secondary education exhibited many categories: None, Four-year college\university, Community college, Vocational or technical school (two-year degree program or certificate), GED program, Regional Occupational Programs, Work force investment act (WIA) supported programs, Non-Workability Employment Program, Adult Training Programs, Military training and incarcerated. For statistical analytical purposes this variable was dichotomized to represent engagement in post-secondary education or no engagement in post-secondary educational opportunities. All educational opportunities were collapsed to "Yes" and "No" represented zero engagement in educational opportunities (None or incarcerated).

Independent Variables – Student Characteristics

Student socio-demographic variables that will be included in the proposed analyses are race\ethnicity, age, gender, and free and reduced lunch (FRL) status. Other student characteristic variables related to school experiences that will be described or included in analysis are, parent attendance at Individual Education Plan (IEP) meeting, inclusion setting, curriculum and school type. All data was collected from administrative records and from annual IEP meetings.

Race\ethnicity

The Ethnicity variable is categorical and captures student's ethnicity as listed on their IEP. This variable was collapsed into 5 unique groups (African-American, Hispanic, White, Asian, and Other) for statistical analytic purposes. The ethnicities represented under Other category were mixed, multiracial, Native American, Pacific Islander and unknown.

Age

The age variable is continuous and captures the age of student at the time of annual IEP meeting. To be eligible to participate in WBL, students must be older than 14 years old. The age range of all subjects\participants in this study was from 16 – 23 due to the eligibility criteria of the school district.

Gender

The Gender variable is binary and captures student gender identified on the IEP (Male or Female).

Free and Reduced Lunch Status (FRL)

The Free and reduced lunch status variable captures if a student and their family qualified for free or reduced lunch rates through federal, state, and district funds. Students and their families qualify for FRL if the total household income is the same or less than the amount set by the district. If a household already receives state or federal assistance programs like CalFresh or Medi-Cal, they automatically qualify for FRL. This is a binary variable (Yes or No).

Income Category

The income category variable captures the median neighborhood income of students and was obtained through Census data based on zip code of residency of students. This variable is categorical and ordinal with 3 levels: less than $40,000; $40,000-$80,000; and $80,000+. This

category was collapsed into three levels because of the low frequency of students in the $120,000+ neighborhood income category. Majority of students in the $80,000+ category fall within $80,000 - $120,000 and only one student in our sample was in $120,000 + category that participated in WBL. The 2 highest level of income levels were collapsed together for statistical analytical purposes.

Parent Participation\family involvement

The parent participation or involvement variable captures parent participation or involvement at the annual IEP meeting for students. This variable is categorical with 4 levels (Participated in meeting, Parent could not attend, gave permission to proceed, No show after 3 attempts).

Inclusion

Inclusion variable indicates whether students were primarily observed in inclusive General Education settings versus segregated special education settings. This binary variable (Yes or No) was created based on the percentage of time students were observed in each setting. Students who were observed in inclusive GE settings more than 50% were assigned "Yes" and student observed in less than 50% of inclusive GE settings were assigned a "No".

Curriculum

Curriculum variable represents the student's curriculum. This variable distinguishes students assigned to the General education track versus Alternate curricula and is binary (Gen or Alt). Students on the General education track are supported with accommodations and services to access the same Common Core standards that their non-disabled peers receive to obtain a high school diploma. The Alternate education curricula is modified standards-based curriculum

intended for students with moderate-severe disabilities who are unable to access the general common core curriculum.

School Type

This variable is categorical and represents the type of school the student attended at the time of the annual IEP meeting. The categories of schools listed are: Community college, public day school, special education center, or other. Other school types category included all of the following: Nonpublic day school, Private day school (not certified by Special Education Division), Charter schools, Community school, Hospital facility, Home instruction, Alternative work education center, continuation school, and Correctional Institution or incarceration facility.

Students attending Public day school receive instruction in a traditional public-school setting and are eligible to participate in WBL. Students in the community college settings were part of the Center for Advanced Transition Skills (CATS) program through the district. The CATS program is a partnership between the school district and the local community college district. These students received instruction on independent living skills, career development, employment preparation, and are highly encouraged to participate work-based learning experience in the community. These students also have the opportunity to take community college courses with support to encourage and promote seamless integration in to community college settings. Students in Special Education Center settings received instruction at Career and Transition Centers (CTC) operated by the school districts Office of Transition Services. The main mission for the CTCs is to prepare students with varying disabilities to transition from school to adult life by providing community integration through independent living skills development, work-based learning experiences, and community-based instruction. One of the main differences between CTCs and the CATS program is the physical setting of instruction.

CTCs are housed on school campus and other district sites operated by the division of special education, while CATS programs are housed at community college campus in collaboration with the district's division of special education.

Statistical Analysis

For our first aim, to illustrate the student characteristics (socio-demographic and other) of students served under the Autism eligibility that participated in WBL opportunities, nominal or categorical data (WBL participation, Race\ethnicity, free and reduced lunch status, median neighborhood income, educational settings, parent participation at IEP) were summarized as counts, frequencies, and percentages while continuous data (i.e., age) was summarized with mean and standard deviation. Nominal or categorical data was also visually represented through tables and bar graphs to describe autism-eligible students between the academic years of 2011 – 2017 (six academic years).

To examine the predictors of WBL placement in our sample of Autism eligible students, a multilevel (hierarchal) logistic regression analysis was conducted to account for nested data at the student level. The dependent variable, Work-based-learning (WBL), was modeled using a binomial distribution with a logit link function, to represent a binary outcome (Yes or No). A random-intercepts model was employed to account for the clustering of observations within individual autism eligible students. A random intercepts approach is appropriate when there is nested structure in the data, such as multiple observations nested within the same student. By including the random intercept in the model, it allowed the intercept to vary randomly across students and captures the unobserved heterogeneity between students that may influence the outcome of WBL participation. The fixed effects included multiple predictor variables: Age, inclusion status, type of school, curriculum, income category, gender, and ethnicity. These

variables were hypothesized to influence the probability of WBL placement in our sub sample of Autism-eligible students. To interpret the effect sizes of significant predictors, Odds ratios (OR) were calculated.

To describe the post-secondary outcomes of Autism eligible students one year after leaving high school, post-secondary education and employment outcomes were tabulated separately. Post-secondary education and employment outcomes are categorical and were summarized as counts, frequencies, and percentages. The outcomes (Employment and post-secondary education) of the entire sample comprised of Autism eligible students in addition to Autism eligible students that participated in WBL opportunities were also described.

Results

Characteristics of Autism eligible students that participated in WBL

Out of the 4057 autism-eligible students between the academic years of 2011 – 2017, 12.94% (n = 525) of students participated in WBL opportunities. Of the 525 autism-eligible students that participated in WBL opportunities, 81% (n = 425) were male and 19% (n=100) were female. The ethnicity breakdown of the 525 autism-eligible students that participated in WBL was as follows: 58.70% (n= 308) were Hispanic\Latino, 17.50% (n = 92) were white, 13.10% (n = 69) were African-American, 4.57% (n = 24) were Asian, and 6.10% (n = 32) were classified as other. More than half of the autism-eligible students that participated in WBL received Free and reduced lunch services (n = 329, 62.67%). The neighborhood median income of autism-eligible students that participated in WBL was as follows: 68% (n = 357) were in 40,000 – 80,000 range ; 22.86% (n = 120) were in the Less than 40,000 range; 7.24% (n = 38) were in the 80,000 – 120,000 range; and 0.19% (n = 1) were in the 120,000 or more range.

The 525 Autism-eligible students who received WBL were observed 691 times in a variety of school settings across the observed years: 61.21% (n = 423) of the time students were served in Public Day Schools; 19.24% (n = 133) of the time students were served in Community College settings; 18.95% (n = 131) of the time students were served in Special Education Center or facility; 0.14% (n = 1) of the times students was served in Continuation Schools; and 0.43% (n = 3) were served in other educational settings. Autism-eligible students participating in WBL were educated using a general education curriculum 38.35% (n = 265) of the time and alternative curriculum 61.21% of the time (n = 423). Autism-eligible students that participated in WBL were included in general education classrooms 333 times (48.19%) of the 691 observations across 525 students.

What grade level and age do Autism eligible students first participate in WBL experiences?

Grade level of first WBL participation was as follows: 83.42% (n = 438) in 12th grade, 14.47% (n = 76) in 11th grade, 1.52% (n = 8) in 10th grade, and 0.57% (n = 3) in the 9th grade. The mean age of students at first instance of WBL participation was 18.06 years (SD = 1.49).

Number of years of WBL participation by Autism eligible students

Autism-eligible students varied in the years of WBL participation. Of the 525 autism-eligible students who received WBL, 78.47% (n = 412) received one year, 15.23% (n = 80) received two years, 3.23% (n = 17) received 3 years, 2.28% (n = 12) received 4 years and 0.76% (n = 4) received 5 years.

Predictors of WBL participation for Autism eligible students

The multi-level logistic regression analysis yielded significant intercept (B = -17.94, SE 0.93, z = -19.33, $p < 0.001$), specifying that the log-odds of WBL participation was significantly different from zero controlling for all other predictors. Student age was a significant predictor of

WBL participation (b= 0.93, SE = 0.05, z = 17.40, $p < 0.001$). This suggests that for each one-unit increase (year) in age, the odds of participating in WBL increases 2.523 times (OR = 2.523, 95% CI [2.279, 2.799], $p < 0.001$).

School type also exhibited significant effects on WBL participation. Specifically, students placed in Community College settings, had higher odds of participating in WBL (B = 2.61, SE 0.44, z = 5.87, $p < 0.001$) compared to students in traditional public general education settings. Students attending school in community college settings were 13.54 times more likely to participate in WBL opportunities compared to students in traditional public education settings (OR = 13.54, 95% CI [8.68, 21.14], $p < 0.001$). In contrast, students placed in Other category (list of schools listed in methods) of school settings had lower odds of participating in WBL compared to public general education settings (B = -4.45, SE = 0.52, z = -8.59, $p < 0.001$). Students in the Other schools category had 99% lower odds of participating in WBL, compared to students in traditional public education settings (OR = 0.011, 95% CI [0.006, 0.020], $p < 0.001$).

Table 4. *Odds ratio and confidence intervals of significant predictor variables related to WBL placement*

Predictor Variables	**Odds Ratio (OR)**	**95 % CI**	**P**
Age	2.52	2.27 - 2.80	$p < 0.001$
Community College versus Public day school	13.55	5.67 - 32.37	$p < 0.001$
Other types of schools versus Public day school	0.01	0.004 - 0.03	$p < 0.001$

None of the other predictor variables (Curriculum, inclusion status, median neighborhood income, gender, or race/ethnicity) were found to have a statistically significant effect on WBL participation (see table 3) for our sample of transition aged autism-eligible students.

Employment outcomes

Out of the 525 Autism-eligible students that participated in WBL between the years of 2011 - 2016, 28% or 147 students provided responses to the one year follow up relating to post-secondary employment outcomes after leaving high school. Of the 147 responses provided by autism-eligible students that participated in WBL: 73.46% (n = 108) reported no employment; 14.28% (n = 21) reported obtaining a competitive employment position; 9.52% (n = 14) reported engagement in other or non-competitive employment options; and 2.72% (n = 4) refused to answer the follow up questions regarding employment.

Post-secondary outcomes

For outcomes related to post-secondary education, 27.61% or 145 of the 525 autism-eligible students that participated in WBL between the years of 2011 – 2016, provided responses at the one year follow up. Of the 145 responses provided, autism-eligible students that participated in WBL were engaged in the following: 44.82% (n = 65) reported attending community college; 24.82% (n = 36) reported zero or no engagement in post-secondary educational opportunities; 6.20% (n = 9) reported attending vocational or technical school (degree or certificate); 4.82% (n = 7) reported attending a four-year university, 1.37% (n = 2) reported engagement in Non-workability Employment programs; 0.68% (n = 1) reported attending Work Force Investment Act (WIA) supported program; 0.68% (n = 1) reported attending General Education Development (GED) completion program; 0.68% (n = 1) reported engaging in Regional Occupational Programs (ROP) classes; and 2.06% (n = 3) refused to answer the question. Out of the autism-eligible students that provided responses at the one year follow up, 24 students reported no engagement in either employment or post-secondary educational opportunities.

Follow-up Participation

Out of the 525 WBL students, 147 provided information about their employment and post-secondary education engagement one year after leaving high school. Of the 147 students that provided follow up data, 82.99% (n = 122) were male and 17.01% (n = 25) were female. Out of the 378 WBL students that did not participate in the one year follow up, 80.16% (n = 303) were male and 19.84% (n = 75) were female. The ethnicity breakdown of WBL students that participated in the one year follow up was as follows: 60.54% (n = 89) were Hispanic\Latino, 17.69% (n = 26) were white, 12.24% (n = 18) were African-American, 4.76% (n = 7) were Asian, and 4.76% (n = 7) were classified as other. The ethnicity breakdown for WBL students that did not participate in the one year follow up was as follows: : 57.94% (n = 219) were Hispanic\Latino, 17.20% (n = 53) were white, 14.02% (n = 53) were African-American, 4.50% (n = 71) were Asian, and 6.35% (n = 24) were classified as other.

The 147 WBL students that participated in the one year follow up were observed in a variety of school settings across the observed years: 71.43% (n = 105) of the time students were served in typical Public Day schools, 16.33% (n = 24) of the time students were served in Community college settings, and 12.24% (n = 18) of the time students were served in Special Education Centers or facilities. Of the 147 students that participated at the one year follow up, 63.27% (n = 93) were educated using the general education curriculum and 36.73% (n = 54) were educated using the alternate curricula. WBL students that participated at the one year follow up were included in general education settings 72.79% (n = 107) of the time.

The 378 WBL students that did not participate in the one year follow up were observed in the following school settings across the observed years: 58.46% (n = 318) of the time were observed in typical Public Day schools, 20.77% (n = 113) of the time were observed in Special

Education Centers or facilities, 20.04% (n = 109) of the time were observed in Community College settings, 0.37% (n = 2) of the time were observed in Nonpublic Day school settings, and 0.18% (n = 1) if the time were observed in Continuation settings. Of the 378 WBL students that did not participate at the one year follow up, 41.01% (n = 155) were educated using the general education curriculum and 58.20% (n = 220) were educated with the alternate curricula. WBL students that did not participate at the one year follow up were part of inclusive general education settings 44.71% (n = 169) of the time.

Autism-eligible students that did not participate in WBL

Out of the 4057 autism-eligible students, 77.39% (n = 3140) did not participate in WBL throughout their high school experience. Of the 3140 autism-eligible students that did not participate in WBL, 83.9% (n = 2635) were male and 16.1% (n = 505) were female. The ethnicity breakdown of students that did not participate in WBL was as follows: 52.10% (n = 1637) were Hispanic\Latino, 23.70% (n = 745) were white, 13.50% (n = 423) were African-American, 5.13% (n = 161) were Asian, and 5.54% (n = 174) were classified as other. The mean age of first observation of autism-eligible students that did not participate in WBL was 16.64 years (SD = 0.72).

The 3140 autism eligible students that did not participate in WBL were observed 4537 times in different school settings across the observed years: 56.40% (n = 2559) of the time students were served in Public Day Schools; 19.44% (n = 882) of the time students were served in nonpublic day schools; 14.86% (n = 674) of the time students were served in Charter schools; 7.36% (n = 334) of the time students were served in Special Education Centers; 1.37% (n = 62) of the time students were served in Private day school; 0.24% (n = 11) of the time students were served in Home instruction settings; 0.15% (n = 7) of the time students were served in

Continuation schools; 0.07% (n = 3) of the time students were served in Community College settings; 0.07% (n = 3) of the time students were served in Other public school settings; 0.02% (n = 1) were served in Hospital facility, and 0.02% (n = 1) of the time students were served in Nonpublic residential school. Autism-eligible students that did not participate in WBL were educated using a general education curriculum 62.13% (n = 2819) of the time and alternative curriculum 37.73% of the time (n = 1712). These students were included in general education classrooms about half the time (n = 2178, 48.01%).

Of the 3140 non-WBL students, 15.38% (n = 483) provided information about employment and educational outcomes one year after leaving high school (see table 5 and 6). Out of the 483 non-WBL students that provided outcome information at the one year follow up, 84.46% (n = 409) were male and 15.32% (n = 74) were female. The ethnicity breakdown of non-WBL students that participated in the one year follow up was as follows: 55.49% (n = 268) were Hispanic\Latino, 22.98% (n = 111) were white, 7.87% (n = 38) were Asian 7.66% (n = 37) were African-American, and 6.00% (n = 29) were classified as other.

A single level logistic regression model focused on the Post-secondary education outcomes of autism eligible students that did not participate in WBL yielded two significant predictors of Post-secondary education outcomes. The curriculum (General or Alternate) that non WBL students accessed in the last year of high school was a significant predictor of Post-secondary education outcomes at the one year follow up ($B = -0.941$, $SE = 0.46$, $z = -2.01$, $p < 0.05$). Non WBL students that were engaged in the alternate curricula in the last year of high school were 61% less likely to achieve positive post-secondary educational outcomes compared to non WBL students that were engaged in the general education curricula (OR = 0.38, 95% CI [0.151, 1.001], $p < 0.05$). In addition, inclusion setting in the last year of high school was also a

significant predictor of post-secondary education outcome for non WBL students (B = 0.614, SE = 0.28, z = 2.12, $p < 0.05$). Non WBL students that were observed in Inclusive settings 50% of the time or more during the last year of high-school school were 84.7% more likely to have positive post-secondary educational outcomes compared to non WBL students that were observed in inclusive settings less than 50% of the time during the last year of high-school (OR = 1.847, 95% CI [1.046, 3.259], $p < 0.04$).

Discussion

The purpose of this study was to identify and describe the participation of transition aged autism-eligible students in school based WBL opportunities and their post-secondary outcomes (employment and education). Less than 13% (n = 525) of autism-eligible students participated in a school-based WBL program. Of the 525 students that participated in WBL opportunities, Hispanic or Latino autism-eligible students represented the largest ethnicity group, followed by white, African-American, Asian, and other. These results were consistent with the demographic population of the school district. Unsurprisingly, majority of WBL students were male and exhibited similar gender ratio differences (4.2:1) as the gender prevalence rate in the population (Frombonne, 2003). More than 60% of WBL students qualified for free and reduced lunch services through the district and almost 70% of the WBL students fell within the neighborhood income category of $40,000 - $80,000. Most studies on employment and education outcomes for autistic individuals are overly represented by white males from middle to upper class (Safer-Lichtenstein et al., 2019; West et al., 2016). White males from middle to upper SES class tend to have the best outcomes based on access to resources and social capital. Our subsample of autism-eligible students that participated in WBL is different than most samples described by researchers and provides insights on the experiences of a more diverse sample that is

representative of the communities in which the participants reside. Most of our participants were Hispanic and more than half of our sample qualified for FRL. In addition, just over 90% of autism-eligible WBL students were in the low to middle SES class and provide additional information about the experiences of these participants.

Majority of the students participated in WBL opportunities in Public day schools followed by community college settings and special education centers. Within these education settings, WBL students were provided alternate curricula just over 60% of the time but were observed in inclusive general education classrooms almost half the time. Students first instance of WBL participation was at 18.06 years (SD = 1.49) and over 80% of students engaged WBL opportunities for the first time in 12th grade. WBL students varied in the years of WBL participation with over 75% of them only receiving one year of WBL. One year of participation may be too short to experience all the different types and aspects of WBL so that student may benefit after high school. In addition, WBL should start and be implemented earlier than 12th grade so that student can receive additional years if needed. By providing WBL earlier on in autism-eligible students high school tenure can help identify strength and weaknesses that students can work on to raise the likelihood of successful employment or educational outcomes later in life.

Post-hoc examination of descriptive information about autism-eligible students revealed similar trends and proportions based on ethnicity and gender for students that did and did not participate in WBL experiences. However, there were differences in curriculum and type of school that autism-eligible students engaged in based on WBL status (participation or no participation). WBL students had a higher proportion of engagement in Alternate curricula (61.22%), while non WBL students exhibited a higher portion of engagement in the general

education curricula (62.13%). Students engaged in WBL rarely attended Non-public schools (0.29%, n = 2) compared to non WBL students (19.44%, n = 882). In addition, WBL students were educated in Community college settings (19.25%, 133) while non WBL students were rarely placed in community college settings (0.07%, n = 3).

Separate post-hoc analysis of predictors of educational outcomes of non WBL students found that curriculum type and participation in inclusive settings were predictors of post-secondary educational engagement. Non WBL students that engaged the general education curricula were more likely to be engaged in post-secondary education than non WBL that engaged the alternate curricula. In addition, non-WBL students that were observed in inclusive settings 50% or more of the time were more likely to exhibit post-secondary educational engagement than non-WBL that were observed in inclusive settings less than 50% of the time.

Students age and type of school setting were found to be statistically significant predictors of WBL participation amongst autism-eligible students. Older students and students receiving instruction in community college settings were significantly more likely to engage in WBL opportunities in our sample. Students in community college settings are part of the CATS (Center for Advanced Transitional Skills) program, which is a partnership between the school district and local community college district. One of the key program components of the CATS program is engagement in WBL opportunities. Students attending Nonpublic day school, Private day school (not certified by Special Education Division), Charter schools, Community school, Hospital facility, Home instruction, Alternative work education center, or continuation schools were significantly less likely to participate in WBL opportunities compared to traditional public day school. Gender, class (FRL and income category), and ethnicity did not predict WBL

participation in our sample, suggesting access to WBL opportunities is equitable within the district.

Out of the 525 WBL students, 28% (n = 147) provided information related to employment and post-secondary education engagement. Additional post-hoc examination of descriptive data about WBL students revealed similar trends and proportions based on ethnicity, gender and School type for students that did and did not participate in the one year follow up. However, there were differences when examining the curricula and inclusive settings between WBL students that did and did not participate at the one year follow up. WBL students that participated at the one year follow up were proportionally more engaged in the general education curricula (62.37%) while WBL students that did not participate at the one year follow up were proportionally more engaged in the alternate curricula (58.20%). In addition, WBL students that participated in the one year follow up were observed in inclusive settings at a higher proportion (72.79%) compared to the WBL students that did not participate in the one year follow up (44.71%).

One possible reason for this high attrition rate at the one year follow up for autism-eligible students could be due to the struggles of the student and their families during this stressful transition stage between high school and post-secondary education or employment. It has been documented that the first two years after leaving high school is tremendously difficult and stressful for autistic transition aged youth and their families with the lowest rates of engagement amongst all disability categories (Shattuck et al., 2012). It can be difficult for families and students to participate in a follow up survey while they are learning to navigate and manage life after high school.

Over 70% of WBL students reported no employment engagement at the one year follow up and only 14% reported engagement in competitive employment options. The negative employment outcomes at the one year follow up are similar to the findings by Shattuck et al., (2012) years earlier. In contrast, WBL students had better engagement in post-secondary educational opportunities. WBL students reported attending community college over 44% of the time while only 24% reported no engagement in any post-secondary education opportunities. Based on our results, post-secondary education options could be a more beneficial and attainable outcome for autism-eligible students that participated in WBL exiting high school. Several studies have shown that post-secondary education is a strong predictor for employment outcomes for autistic young adults (Migliore et al., 2012; Whittenburg et al., 2019). Attending post-secondary education options also provides time for students to mature and attain additional skills while being provided the supports and accommodations which may lead to attainment of competitive employment opportunities. During PSE engagement students have the opportunities to develop skills related to navigating public transport, asking for accommodations, engage in work-study programs, develop vocational skills, enhance daily living, and social skills.

The results from the current study and similar studies regarding educational and employment outcomes can add to what the Office of Special Education Programs (OSEP) and the Individuals with Disabilities Education Act (IDEA) are aiming to do with the Indicator 14 policy. The indicator 14 policy is a critical component of IDEA and it evaluates the post-school outcomes of disabled students. The federal policy requires school districts and states to report information on indicators such as postsecondary education enrollment and employment status, to evaluate the effectiveness of transition related services like WBL. By analyzing the data, administrators and policy makers can track and identify areas of improvement in transition

services for disabled students to increase the rates of successful transition in to adulthood. Indicator 14 policy highlights the significance of providing equitable opportunities and significant supports to promote positive transitions for all disabled students.

Limitations

Several limitations should be considered when interpreting the results of this study. One limitation of the study is related to the way the dataset was compiled and collected by the district. The dataset has student and WBL information for 6 academic years (2011 – 2016), however, there is variability in the number of years of data we have for each student. Second, the dataset from the district contained large amount of missing data. Listwise or case deletion was used for statistical analysis rather than imputation or substitution methods. Listwise deletion is the most common method for handling missing data and was chosen even though the missing data did not completely fulfill the assumptions of Missing Completely at Random (MCAR). Imputation or substitution methods can make interpretation of results more complicated and many of these methods should not be used with categorical or nominal data. Another limitation of the study is that variables commonly used in other studies were not collected limiting comparisons to previous literature. There was limited information on specific student characteristics in the dataset. These variables include diagnostic data, IQ, adaptive functioning skills, types of WBL engagement, self-determination data, academic test data, and more detailed data about specific occupations or levels of employment that students were able to attain.

Implications

This study characterized autism-eligible students from a large metropolitan school district that participated in WBL opportunities and their post-school outcomes. However, it did not clarify the role specific WBL experiences (see table 1) have on detailed employment outcomes

such as industry type or level of employment (hours, pay, and benefits). Future research should evaluate the specific types of WBL experiences that students engage in to understand their effectiveness in promoting and preparing for post-school outcomes. The quality and quantity (participation time) of WBL experiences should be evaluated to determine which strategies and intensity would benefit autism-eligible students the most. In addition, the effects of other student factors like diagnostic criteria, cognitive functioning, levels of self-determination, and adaptive functioning skills on WBL participation and post-secondary outcomes (education and employment) should be evaluated. This would add to our existing results and elucidate specific profiles of autism-eligible students that might benefit most from WBL participation and how to further support them.

The sample of the current study was representative of the city that the district served and differed from typical samples used in autism research. The majority of our autism-eligible student sample belonged in the low to middle income category and identified as Hispanic, unlike typical autism research samples consisting of upper to middle class white males (Safer-Lichtenstein et al., 2019; West et al., 2016). Our sample exhibited difficulties in obtaining employment outcomes following high school as previous studies (Newman et al., 2011; Shattuck, Narendorf, et al., 2012). Future studies should focus on systemic barriers within school systems, community settings, and employment settings and how they interact to effect employment and educational outcomes of autistic individuals. In addition, more research focused on the intersectionality of autism and race\ethnicity on important outcomes throughout the lifespan (toddler, school-aged, adolescent, transition-aged youth, adulthood, and geriatric) is needed be to understand the experiences of distinctive groups.

Results of this study highlight general student characteristics that predict WBL participation but detailed data about school characteristics and services should be considered for the future. Students spend majority of their day in school settings and there are existing infrastructures to promote positive post-school outcomes. Schools can play a significant role in providing interventions and strategies beyond academic achievement or engagement. Information specific to the district, schools, programs, classrooms and teachers can provide additional data on the barriers and predictors of successful transition to employment or post-secondary education for autism-eligible students after leaving the public-school system. For example, information about the education and experience level of the teacher in implementing WBL or the level of collaboration between teachers, support staff, and school administrators can have meaningful effects on post-school outcomes of autistic students. The nested nature of this data would provide valuable detailed information that can aid both schools and families in supporting their autism-eligible students. Schools and districts can also benefit by understanding how they are meeting the needs of students and what needs to change in educational environments to support autistic transition aged students during and immediately after high school.

Appendix

Table 1.
Description of types of Work-Based Learning Experiences

Type of WBL	Description
Career exploration	Students engage in worksite tours, guest speaker presentations, and Q & A sessions. These activities provide opportunities to learn about various jobs and careers by interacting with professionals in specific occupations and employers of workplace settings.
Job shadowing	Students accompanying employees at a company to gain insights into the daily responsibilities and requirements of specific jobs or occupations. This unique experience introduces students to various roles, job requirements, work culture, and potential career paths.
Work sampling	Students are exposed to various work requirements, demands and environments. schools and community service providers focused on employment offer rotations across multiple workplaces, enabling students to "sample" different job types, tasks, and work settings.
Service learning	Students participated in hands on volunteer service to the community that is combined with classroom course objectives. This hands-on experience helps identify potential career paths and consider further post-secondary education, in hopes of increasing likelihood of employment.
Internships	Students have formal agreements with employers for a predetermined period of time. Internships can be paid or unpaid, independent from

	school experiences or paired with specific curriculum requirement from school. Students are provided opportunities to acquire and practice pragmatic job skills in real-world workplace settings.
Apprenticeships	Students are provided hands-on training under the supervision of skills professionals. Apprenticeships are linked with a specific trade and vary widely in the variation of occupations. It enables students to develop industry-specific skills and knowledge.
Paid employment	Students work full or part time in a tailored work assignment created in conjunction with an employer. Paid employment can be done during or after a school day and can be linked to specific IEP goals of the student.

Luecking (2003, p. 7-10).

Table 3.
Multi-Level Logistic Regression with Random Intercepts Predicting WBL participation (n = 3595).

Variable	Estimate	SE	95% CI		p
			LL	*UL*	
Intercept	-17.93	0.92	-19.75	-16.11	p < 0.001
Age	0.92	0.05	0.82	1.02	p < 0.001
Inclusion Setting					
No versus Yes	0.19	0.14	-0.08	0.47	0.16
School Type [a]					
Community College	2.60	0.44	1.73	3.47	p < 0.001
Special Education Center	-0.10	0.18	-0.47	0.26	0.56
Other types	-4.46	0.51	-5.48	-3.44	p < 0.001
Curriculum					
General	-0.05	0.15	-0.34	0.24	0.73
Neighborhood Income [b]					
40k – 80k	-0.02	0.13	-0.9	0.23	0.84
80K +	-0.08	0.23	-0.54	0.37	0.72
Gender					
Female	0.27	0.14	-0.001	0.55	0.05
Ethnicity [c]					
African American	-0.10	0.16	-0.44	0.22	0.51
White	-0.15	0.15	-0.46	0.16	0.34
Asian	-0.50	0.27	-1.04	0.03	0.06
Other	-0.35	0.24	-0.83	0.12	0.14

Note: CI = confidence interval; LL = lower limit; UL = upper limit.
[a] Reference group for school type was Public day school; [b] Reference group for income was Less than 40k; [c] Reference group for ethnicity is Hispanic.

Table 5.
Employment outcomes of non-WBL students (n = 465)

Employment	N	%
Yes employment	84	18.06
No employment	381	81.94

Table 6.
Post-secondary outcomes of non-WBL students (n = 483)

Outcomes	N	%
Community College	282	58.38
None	76	15.73
Four-year college\university	71	14.69
Vocational or technical school	21	4.34
Military training	11	2.27
Adult training program	10	2.07
Regional Occupational Programs	6	1.24
Incarcerated	3	0.62
GED program	2	0.41
Non-workability employment program	1	0.20

Reference

Alverson, C. Y., & Yamamoto, S. H. (2017). Employment Outcomes of Vocational Rehabilitation Clients With Autism Spectrum Disorders. *Career Development and Transition for Exceptional Individuals*, *40*(3), 144–155. https://doi.org/10.1177/2165143416629366

American Psychological Association. (2016). *Socioeconomic status*. Https://Www.Apa.Org. https://www.apa.org/topics/socioeconomic-status

Australian Bureau of Statistics. (2013). *Disability, Ageing and Carers, Australia: Summary of Findings, 2018 | Australian Bureau of Statistics*. https://www.abs.gov.au/statistics/health/disability/disability-ageing-and-carers-australia-summary-findings/latest-release

Baer, R. M., Daviso, A. W., Flexer, R. W., McMahan Queen, R., & Meindl, R. S. (2011). Students With Intellectual Disabilities: Predictors of Transition Outcomes. *Career Development for Exceptional Individuals*, *34*(3), 132–141. https://doi.org/10.1177/0885728811399090

Bailey, T., & Hughes, K. (1999). *Employer Involvement in Work-Based Learning Programs*. National Dissemination Center for Career and Technical Education, 1900 Kenny Road, Columbus, OH 432110-1090 (order no. https://eric.ed.gov/?id=ED436641

Banach, R., Thompson, A., Szatmari, P., Goldberg, J., Tuff, L., Zwaigenbaum, L., & Mahoney, W. (2009). Brief Report: Relationship Between Non-verbal IQ and Gender in Autism. *Journal of Autism and Developmental Disorders*, *39*(1), 188–193. https://doi.org/10.1007/s10803-008-0612-4

Benard, B. (2004). *Resiliency: What We Have Learned*. WestEd.

Bölte, S., Duketis, E., Poustka, F., & Holtmann, M. (2011). Sex differences in cognitive domains and their clinical correlates in higher-functioning autism spectrum disorders. *Autism*, *15*(4), 497–511. https://doi.org/10.1177/1362361310391116

Booth, K. (1991). Security and emancipation. *Review of International Studies*, *17*(4), 313–326. https://doi.org/10.1017/S0260210500112033

Camarena, P. M., & Sarigiani, P. A. (2009). Postsecondary Educational Aspirations of High-Functioning Adolescents With Autism Spectrum Disorders and Their Parents. *Focus on Autism and Other Developmental Disabilities*, *24*(2), 115–128. https://doi.org/10.1177/1088357609332675

Carr, T., & Lord, C. (2016). A pilot study promoting participation of families with limited resources in early autism intervention. *Research in Autism Spectrum Disorders*, *25*, 87–96. https://doi.org/10.1016/j.rasd.2016.02.003

Carter, A. S., Black, D. O., Tewani, S., Connolly, C. E., Kadlec, M. B., & Tager-Flusberg, H. (2007). Sex Differences in Toddlers with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*, *37*(1), 86–97. https://doi.org/10.1007/s10803-006-0331-7

Carter, E. W., Austin, D., & Trainor, A. A. (2012). Predictors of Postschool Employment Outcomes for Young Adults With Severe Disabilities. *Journal of Disability Policy Studies*, *23*(1), 50–63. https://doi.org/10.1177/1044207311414680

Carter, E. W., Swedeen, B., & Trainor, A. A. (2009). The other Three Months: Connecting Transition-Age Youth with Disabilities to Meaningful Summer Experiences. *TEACHING Exceptional Children*, *41*(6), 18–26. https://doi.org/10.1177/004005990904100603

Cease-Cook, J., Fowler, C., & Test, D. W. (2015). Strategies for Creating Work-Based Learning Experiences in Schools for Secondary Students With Disabilities. *TEACHING Exceptional Children*, *47*(6), 352–358. https://doi.org/10.1177/0040059915580033

Cederlund, M., Hagberg, B., Billstedt, E., Gillberg, I. C., & Gillberg, C. (2008). Asperger Syndrome and Autism: A Comparative Longitudinal Follow-Up Study More than 5 Years after Original Diagnosis. *Journal of Autism and Developmental Disorders*, *38*(1), 72–85. https://doi.org/10.1007/s10803-007-0364-6

Chen, J. L., Sung, C., & Pi, S. (2015). Vocational Rehabilitation Service Patterns and Outcomes for Individuals with Autism of Different Ages. *Journal of Autism and Developmental Disorders*, *45*(9), 3015–3029. https://doi.org/10.1007/s10803-015-2465-y

Chiang, H.-M., Cheung, Y. K., Hickson, L., Xiang, R., & Tsai, L. Y. (2012). Predictive Factors of Participation in Postsecondary Education for High School Leavers with Autism. *Journal of Autism and Developmental Disorders*, *42*(5), 685–696. https://doi.org/10.1007/s10803-011-1297-7

Chiang, H.-M., Cheung, Y. K., Li, H., & Tsai, L. Y. (2013). Factors Associated with Participation in Employment for High School Leavers with Autism. *Journal of Autism and Developmental Disorders*, *43*(8), 1832–1842. https://doi.org/10.1007/s10803-012-1734-2

Colley, D. A., & Jamison, D. (1998). Post School Results For Youth With Disabilities: Key Indicators And Policy Implications. *Career Development for Exceptional Individuals*, *21*(2), 145–160. https://doi.org/10.1177/088572889802100204

Cote, J. E., & Levine, C. G. (2014). *Identity, Formation, Agency, and Culture: A Social Psychological Synthesis*. Psychology Press.

Darche, S., Nayar, N., & Bracco, K. R. (2009). *Work-Based Learning in California*.

Dean, E. E., Burke, K. M., Shogren, K. A., & Wehmeyer, M. L. (2017). Promoting Self-Determination and Integrated Employment Through the Self-Determined Career Development Model. *Advances in Neurodevelopmental Disorders*, *1*(2), 55–62. https://doi.org/10.1007/s41252-017-0011-y

Dong, S., Fabian, E., & Luecking, R. G. (2016). Impacts of School Structural Factors and Student Factors on Employment Outcomes for Youth With Disabilities in Transition: A Secondary Data Analysis. *Rehabilitation Counseling Bulletin*, *59*(4), 224–234. https://doi.org/10.1177/0034355215595515

Drasgow, E., Yell, M. L., & Robinson, T. R. (2001). Developing Legally Correct and Educationally Appropriate IEPs. *Remedial and Special Education*, *22*(6), 359–373. https://doi.org/10.1177/074193250102200606

Dyches, T. T., Wilder, L. K., Sudweeks, R. R., Obiakor, F. E., & Algozzine, B. (2004). Multicultural Issues in Autism. *Journal of Autism and Developmental Disorders*, *34*(2), 211–222. https://doi.org/10.1023/B:JADD.0000022611.80478.73

Eaves, L. C., & Ho, H. H. (2008). Young Adult Outcome of Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*, *38*(4), 739–747. https://doi.org/10.1007/s10803-007-0441-x

Eilenberg, J. S., Paff, M., Harrison, A. J., & Long, K. A. (2019). Disparities Based on Race, Ethnicity, and Socioeconomic Status Over the Transition to Adulthood Among Adolescents and Young Adults on the Autism Spectrum: A Systematic Review. *Current Psychiatry Reports*, *21*(5), 32. https://doi.org/10.1007/s11920-019-1016-1

Farley, M. A., McMahon, W. M., Fombonne, E., Jenson, W. R., Miller, J., Gardner, M., Block, H., Pingree, C. B., Ritvo, E. R., Ritvo, R. A., & Coon, H. (2009). Twenty-year outcome for individuals with autism and average or near-average cognitive abilities. *Autism Research*, *2*(2), 109–118. https://doi.org/10.1002/aur.69

Fish, W. W. (2008). The IEP Meeting: Perceptions of Parents of Students Who Receive Special Education Services. *Preventing School Failure: Alternative Education for Children and Youth*, *53*(1), 8–14. https://doi.org/10.3200/PSFL.53.1.8-14

Fombonne, E. (2003). Epidemiological Surveys of Autism and Other Pervasive Developmental Disorders: An Update. *Journal of Autism and Developmental Disorders*, *33*(4), 365–382. https://doi.org/10.1023/A:1025054610557

Gillespie, E. B., & Turnbull, A. P. (1983). It's My IEP!0 Involving Students in the Planning Process. *TEACHING Exceptional Children*, *16*(1), 26–29. https://doi.org/10.1177/004005998301600107

Gotham, K., Marvin, A. R., Taylor, J. L., Warren, Z., Anderson, C. M., Law, P. A., Law, J. K., & Lipkin, P. H. (2015). Characterizing the daily life, needs, and priorities of adults with autism spectrum disorder from Interactive Autism Network data. *Autism*, *19*(7), 794–804. https://doi.org/10.1177/1362361315583818

Granovetter, M. (1995). *Coase Revisited: Business Groups in the Modern Economy*. https://arch.neicon.ru:80/xmlui/handle/123456789/747110

Griffin, M. M., Taylor, J. L., Urbano, R. C., & Hodapp, R. M. (2014). Involvement in Transition Planning Meetings Among High School Students With Autism Spectrum Disorders. *The Journal of Special Education*, *47*(4), 256–264. https://doi.org/10.1177/0022466913475668

Haimson, J., & Bellotti, J. (2001). *Schooling in the Workplace: Increasing the Scale and Quality of Work-Based Learning* [Mathematica Policy Research Reports]. Mathematica Policy Research. https://econpapers.repec.org/paper/mprmprres/bee95e68835a4d36a73199a3c058d3e5.htm

Halpern, A. S., Yovanoff, P., Doren, B., & Benz, M. R. (1995). Predicting Participation in Postsecondary Education for School Leavers with Disabilities. *Exceptional Children*, *62*(2), 151–164. https://doi.org/10.1177/001440299506200205

Hilton, C. L., Fitzgerald, R. T., Jackson, K. M., Maxim, R. A., Bosworth, C. C., Shattuck, P. T., Geschwind, D. H., & Constantino, J. N. (2010). Brief Report: Under-Representation of African Americans in Autism Genetic Research: A Rationale for Inclusion of Subjects Representing Diverse Family Structures. *Journal of Autism and Developmental Disorders*, *40*(5), 633–639. https://doi.org/10.1007/s10803-009-0905-2

Hoerner, J., & Wehrley, J. (1995). *Work-based learning in California: Opportunities and models for expansion | VOCEDplus, the international tertiary education and research database*. https://www.voced.edu.au/content/ngv:59054

Holtmann, M., Bölte, S., & Poustka, F. (2007). Autism spectrum disorders: Sex differences in autistic behaviour domains and coexisting psychopathology. *Developmental Medicine & Child Neurology*, *49*(5), 361–366. https://doi.org/10.1111/j.1469-8749.2007.00361.x

Howlin, P., Alcock, J., & Burkin, C. (2005). An 8-year follow-up of a specialist supported employment service for high-ability adults with autism or Asperger syndrome. *Autism*, *9*(5), 533–549. https://doi.org/10.1177/1362361305057871

Howlin, P., Goode, S., Hutton, J., & Rutter, M. (2004). Adult outcome for children with autism. *Journal of Child Psychology and Psychiatry*, *45*(2), 212–229. https://doi.org/10.1111/j.1469-7610.2004.00215.x

Howlin, P., Mawhood, L., & Rutter, M. (2000). Autism and Developmental Receptive Language Disorder—a Follow-up Comparison in Early Adult Life. II: Social, Behavioural, and Psychiatric Outcomes. *Journal of Child Psychology and Psychiatry*, *41*(5), 561–578. https://doi.org/10.1111/1469-7610.00643

Howlin, P., & Moss, P. (2012). Adults with Autism Spectrum Disorders. *The Canadian Journal of Psychiatry*, *57*(5), 275–283. https://doi.org/10.1177/070674371205700502

Howlin, P., Savage, S., Moss, P., Tempier, A., & Rutter, M. (2014). Cognitive and language skills in adults with autism: A 40-year follow-up. *Journal of Child Psychology and Psychiatry*, *55*(1), 49–58. https://doi.org/10.1111/jcpp.12115

Hughes, C., & Carter, E. W. (2000). *The transition handbook: Strategies high school teachers use that work!* P.H. Brookes Pub.

Kirby, A. V. (2016). Parent Expectations Mediate Outcomes for Young Adults with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, *46*(5), 1643–1655. https://doi.org/10.1007/s10803-015-2691-3

Kistner, J., & Robbins, F. (1986). Brief report: Characteristics of methods of subject selection and description in research on autism. *Journal of Autism and Developmental Disorders*, *16*(1), 77–82. https://doi.org/10.1007/BF01531580

Landmark, L. J., Ju, S., & Zhang, D. (2010). Substantiated Best Practices in Transition: Fifteen Plus Years Later. *Career Development for Exceptional Individuals*, *33*(3), 165–176. https://doi.org/10.1177/0885728810376410

Lawer, L., Brusilovskiy, E., Salzer, M. S., & Mandell, D. S. (2009). Use of Vocational Rehabilitative Services Among Adults with Autism. *Journal of Autism and Developmental Disorders*, *39*(3), 487–494. https://doi.org/10.1007/s10803-008-0649-4

Lee, S.-H., Wehmeyer, M. L., Palmer, S. B., Soukup, J. H., & Little, T. D. (2008). Self-Determination and Access to the General Education Curriculum. *The Journal of Special Education*, *42*(2), 91–107. https://doi.org/10.1177/0022466907312354

Lindstrom, L., Doren, B., & Miesch, J. (2011). Waging a Living: Career Development and Long-Term Employment Outcomes for Young Adults with Disabilities. *Exceptional Children*, *77*(4), 423–434. https://doi.org/10.1177/001440291107700403

Liptak, G. S., Kennedy, J. A., & Dosa, N. P. (2011). Social Participation in a Nationally Representative Sample of Older Youth and Young Adults With Autism. *Journal of Developmental & Behavioral Pediatrics*, *32*(4), 277. https://doi.org/10.1097/DBP.0b013e31820b49fc

Luecking, R. G. (2009). The Way to Work: How to Facilitate Work Experiences for Youth in Transition. In *Brookes Publishing Company*. Brookes Publishing Company.

Luecking, R. G., Fabian, Ellen. S., Contreary, K., Honeycutt, T. C., & Luecking, D. M. (2018). Vocational Rehabilitation Outcomes for Students Participating in a Model Transition Program. *Rehabilitation Counseling Bulletin*, *61*(3), 154–163. https://doi.org/10.1177/0034355217713167

Luecking, R. G., & Wittenburg, D. (2009). Providing supports to youth with disabilities transitioning to adulthood: Case descriptions from the Youth Transition Demonstration. *Journal of Vocational Rehabilitation*, *30*(3), 241–251. https://doi.org/10.3233/JVR-2009-0464

Ma, J., Pender, M., & Welch, M. (2016). Education Pays 2016: The Benefits of Higher Education for Individuals and Society. Trends in Higher Education Series. In *College Board*. College Board. https://eric.ed.gov/?id=ED572548

McLennan, J. D., Lord, C., & Schopler, E. (1993). Sex differences in higher functioning people with autism. *Journal of Autism and Developmental Disorders*, *23*(2), 217–227. https://doi.org/10.1007/BF01046216

Migliore, A., Timmons, J., Butterworth, J., & Lugas, J. (2012). Predictors of Employment and Postsecondary Education of Youth With Autism. *Rehabilitation Counseling Bulletin*, *55*(3), 176–184. https://doi.org/10.1177/0034355212438943

Newman, L., Wagner, M., Knokey, A.-M., Marder, C., Nagle, K., Shaver, D., & Wei, X. (2011). The Post-High School Outcomes of Young Adults with Disabilities up to 8 Years after High School: A Report from the National Longitudinal Transition Study-2 (NLTS2). NCSER 2011-3005. In *National Center for Special Education Research*. National Center for Special Education Research. https://eric.ed.gov/?id=ED524044

Nord, D. K., Stancliffe, R. J., Nye-Lengerman, K., & Hewitt, A. S. (2016). Employment in the community for people with and without autism: A comparative analysis. *Research in Autism Spectrum Disorders*, *24*, 11–16. https://doi.org/10.1016/j.rasd.2015.12.013

Palmer, S. B., Wehmeyer, M. L., Gipson, K., & Agran, M. (2004). Promoting Access to the General Curriculum by Teaching Self-Determination Skills. *Exceptional Children*, *70*(4), 427–439. https://doi.org/10.1177/001440290407000403

Papay, C. K., & Bambara, L. M. (2014). Best Practices in Transition to Adult Life for Youth With Intellectual Disabilities. *Career Development and Transition for Exceptional Individuals*, *37*(3), 136–148. https://doi.org/10.1177/2165143413486693

Pierce, N. P., O'Reilly, M. F., Sorrells, A. M., Fragale, C. L., White, P. J., Aguilar, J. M., & Cole, H. A. (2014). Ethnicity Reporting Practices for Empirical Research in Three Autism-Related Journals. *Journal of Autism and Developmental Disorders*, *44*(7), 1507–1519. https://doi.org/10.1007/s10803-014-2041-x

Rabren, K., Dunn, C., & Chambers, D. (2002). Predictors of Post-High School Employment Among Young Adults with Disabilities. *Career Development for Exceptional Individuals*, *25*(1), 25–40. https://doi.org/10.1177/088572880202500103

Ratto, A. B., Reznick, J. S., & Turner-Brown, L. (2016). Cultural Effects on the Diagnosis of Autism Spectrum Disorder Among Latinos. *Focus on Autism and Other Developmental Disabilities*, *31*(4), 275–283. https://doi.org/10.1177/1088357615587501

Roux, A. M., Shattuck, P. T., Cooper, B. P., Anderson, K. A., Wagner, M., & Narendorf, S. C. (2013). Postsecondary Employment Experiences Among Young Adults With an Autism Spectrum Disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, *52*(9), 931–939. https://doi.org/10.1016/j.jaac.2013.05.019

Roux, A. M., Shattuck, P. T., Rast, J. E., Rava, J. A., Edwards, A. D., Wei, X., McCracken, M., & Yu, J. W. (2015). Characteristics of Two-Year College Students on the Autism Spectrum and Their Support Services Experiences. *Autism Research and Treatment*, *2015*, 1–10. https://doi.org/10.1155/2015/391693

Safer-Lichtenstein, J., Hamilton, J. C., & McIntyre, L. L. (2019). Examining Demographics in Randomized Controlled Trials of Group-Based Social Skills Interventions for Individuals with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, *49*(8), 3453–3461. https://doi.org/10.1007/s10803-019-04063-4

Sands, D. J., & Wehmeyer, M. L. (Eds.). (1996). *Self-determination across the life span: Independence and choice for people with disabilities*. P.H. Brookes Pub.

Saulnier, C. A., & Klaiman, C. (2018). *Essentials of Adaptive Behavior Assessment of Neurodevelopmental Disorders*. John Wiley & Sons.

Schulz, B. (2008). *The importance of soft skills: Education beyond academic knowledge*.

Seltzer, M. M., Shattuck, P., Abbeduto, L., & Greenberg, J. S. (2004). Trajectory of development in adolescents and adults with autism. *Mental Retardation and Developmental Disabilities Research Reviews*, *10*(4), 234–247. https://doi.org/10.1002/mrdd.20038

Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary Education and Employment Among Youth With an Autism Spectrum Disorder. *Pediatrics*, *129*(6), 1042–1049. https://doi.org/10.1542/peds.2011-2864

Shattuck, P. T., Roux, A. M., Hudson, L. E., Taylor, J. L., Maenner, M. J., & Trani, J.-F. (2012). Services for Adults with an Autism Spectrum Disorder. *The Canadian Journal of Psychiatry*, *57*(5), 284–291. https://doi.org/10.1177/070674371205700503

Shattuck, P. T., Wagner, M., Narendorf, S., Sterzing, P., & Hensley, M. (2011). Post–High School Service Use Among Young Adults With an Autism Spectrum Disorder. *Archives of Pediatrics & Adolescent Medicine*, *165*(2), 141–146. https://doi.org/10.1001/archpediatrics.2010.279

Shogren, K. A. (2013). Considering Context: An Integrative Concept for Promoting Outcomes in the Intellectual Disability Field. *Intellectual and Developmental Disabilities*, *51*(2), 132–137. https://doi.org/10.1352/1934-9556-51.2.132

Shogren, K. A., & Plotner, A. J. (2012). Transition Planning for Students With Intellectual Disability, Autism, or Other Disabilities: Data from the National Longitudinal Transition Study-2. *Intellectual and Developmental Disabilities*, *50*(1), 16–30. https://doi.org/10.1352/1934-9556-50.1.16

Shogren, K. A., Wehmeyer, M. L., & Burke, K. M. (2017). Self-determination. In K. A. Shogren, M. L. Wehmeyer, & N. N. Singh (Eds.), *Handbook of Positive Psychology in Intellectual and Developmental Disabilities: Translating Research into Practice* (pp. 49–64). Springer International Publishing. https://doi.org/10.1007/978-3-319-59066-0_5

Shogren, K. A., Wehmeyer, M. L., & Palmer, S. B. (2017). Causal Agency Theory. In M. L. Wehmeyer, K. A. Shogren, T. D. Little, & S. J. Lopez (Eds.), *Development of Self-Determination Through the Life-Course* (pp. 55–67). Springer Netherlands. https://doi.org/10.1007/978-94-024-1042-6_5

Szatmari, P., Bartolucci, G., Bremner, R., Bond, S., & Rich, S. (1989). *A follow-up study of high-functioning autistic children*.

Taylor, J. L., Henninger, N. A., & Mailick, M. R. (2015). Longitudinal patterns of employment and postsecondary education for adults with autism and average-range IQ. *Autism*, *19*(7), 785–793. https://doi.org/10.1177/1362361315585643

Taylor, J. L., & Seltzer, M. M. (2011). Employment and Post-Secondary Educational Activities for Young Adults with Autism Spectrum Disorders During the Transition to Adulthood. *Journal of Autism and Developmental Disorders*, *41*(5), 566–574. https://doi.org/10.1007/s10803-010-1070-3

Tek, S., & Landa, R. J. (2012). Differences in Autism Symptoms Between Minority and Non-Minority Toddlers. *Journal of Autism and Developmental Disorders*, *42*(9), 1967–1973. https://doi.org/10.1007/s10803-012-1445-8

Test, D. W., Mazzotti, V. L., Mustian, A. L., Fowler, C. H., Kortering, L., & Kohler, P. (2009). Evidence-Based Secondary Transition Predictors for Improving Postschool Outcomes for Students With Disabilities. *Career Development for Exceptional Individuals*, *32*(3), 160–181. https://doi.org/10.1177/0885728809346960

Wagner, M., Newman, L., Cameto, R., Javitz, H., & Valdes, K. (2012). A National Picture of Parent and Youth Participation in IEP and Transition Planning Meetings. *Journal of Disability Policy Studies*, *23*(3), 140–155. https://doi.org/10.1177/1044207311425384

Wehman, P. (2013). Transition From School to Work: Where Are We and Where Do We Need to Go? *Career Development and Transition for Exceptional Individuals*, *36*(1), 58–66. https://doi.org/10.1177/2165143413482137

Wehman, P., Schall, C., Carr, S., Targett, P., West, M., & Cifu, G. (2014). Transition From School to Adulthood for Youth With Autism Spectrum Disorder: What We Know and What We Need to Know. *Journal of Disability Policy Studies*, *25*(1), 30–40. https://doi.org/10.1177/1044207313518071

Wehmeyer, M. (1997). Self-Determination as an Educational Outcome: A Definitional Framework and Implications for Intervention. *Journal of Developmental and Physical Disabilities*, *9*(3), 175–209. https://doi.org/10.1023/A:1024981820074

Wehmeyer, M. L. (1992). Self-Determination and the Education of Students with Mental Retardation. *Education and Training in Mental Retardation*, *27*(4), 302–314.

Wehmeyer, M. L., Kelchner, K., & Richards, S. (1996). *Essential Characteristics of Self Determined Behavior of Individuals With Mental Retardation*. 11.

Wei, X., Wagner, M., Hudson, L., Yu, J. W., & Javitz, H. (2016). The Effect of Transition Planning Participation and Goal-Setting on College Enrollment Among Youth With Autism Spectrum Disorders. *Remedial and Special Education*, *37*(1), 3–14. https://doi.org/10.1177/0741932515581495

Wei, X., Wagner, M., Hudson, L., Yu, J. W., & Shattuck, P. (2015). Transition to Adulthood: Employment, Education, and Disengagement in Individuals With Autism Spectrum Disorders. *Emerging Adulthood*, *3*(1), 37–45. https://doi.org/10.1177/2167696814534417

West, E. A., Travers, J. C., Kemper, T. D., Liberty, L. M., Cote, D. L., McCollow, M. M., & Stansberry Brusnahan, L. L. (2016). Racial and Ethnic Diversity of Participants in Research Supporting Evidence-Based Practices for Learners With Autism Spectrum Disorder. *The Journal of Special Education*, *50*(3), 151–163. https://doi.org/10.1177/0022466916632495

Whittenburg, H. N., Cimera, R. E., & Thoma, C. A. (2019). Comparing Employment Outcomes of Young Adults with Autism: Does Postsecondary Educational Experience Matter? *Journal of Postsecondary Education and Disability*, *32*(2), 159–172.

Williams-Diehm, K. L., & Benz, M. R. (2008). Where Are They Now? Lessons from a Single District Follow-Up Study. *Journal for Vocational Special Needs Education*, *30*(2), 4–15.